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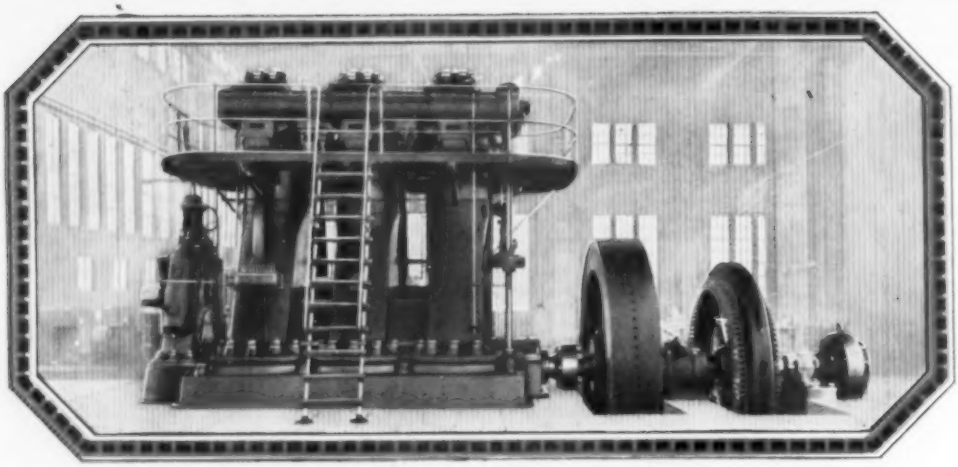

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Fire Prevention and Fire Protection Campaigns*

The Public Water-Supply and the Part Played by the Local Water-Works Superintendent

By Frank C. Jordan

Secretary, Indianapolis Water Company

A CAREFUL survey seems to indicate that the only answer which our country makes to the ever-increasing fire loss is to add largely to its insurance premiums and to its fire departments, both in men and equipment. To-day our fire departments are recognized as the most efficient in the world; and well they need be. We are confronted with the lamentable fact that our country, with all of its wonderful development and wonderful fire-fighting force and equipment, has an annual fire loss of almost $5 per capita, whereas the foreign countries, with antiquated fire-fighting equipment but with careful habits reinforced by severe personal liability laws, have an annual per capita fire loss ranging from 11 to 60 cents.

America's fire loss has reached the proportions of a national calamity and we are becoming a criminally careless people. This matter of burning four or five hundred million dollars' worth of property every year has ceased to be a matter of no concern. Our increasing fire loss stands as a serious indictment of the American public. Our 1921 fire loss means that five hundred million dollars' worth of our natural and created resources are wiped out of existence. There is a prevailing opinion that fire insurance companies in some mysterious way make good our loss by fire. The proceeds of a fire insurance policy may reimburse the individual for the loss he has sustained, but no amount of money can restore a burned structure; therefore, when a fire occurs, everybody loses.

In view of our appalling loss in life and property, it is imperative that all national organizations give most careful attention to the question of fire protection and fire prevention and exert every effort to bring about the elimination of all fires classed as preventable. It is high time that we turn the spotlight of publicity on our fire loss, make a careful study of the causes of our fires, and map out a carefully prepared campaign of education, to the end that the right-thinking people of this country may understand the seriousness of our fire loss and take proper steps to cut this loss to a minimum figure. This campaign of education should be followed by the enactment of rigid laws covering personal liability for preventable fires, and these laws should be enforced to the letter so that the irresponsible or evil-minded citizen will be compelled to eliminate preventable fires.

The fire department is not maintained to

* From a paper presented before the American Water Works Association, May 16, 1922.

protect a man from the results of his negligence, and when he calls upon the city in any such case he should be made to pay for this service. No civilized country should expect its firemen to risk their lives in fighting fires which are easily preventable. In many of the foreign countries, a man who has a fire must prove to the court that he was in no way responsible for the fire, or he is subjected to a fine and the loss of his insurance. The public conscience has become dulled to the necessity for any fire prevention measures. We feel relieved when we read the words, "Fully covered by insurance," and we feel that some soulless corporation called an insurance company will shake a tree bearing a never-ending crop of dollars and gather up this money and hand it to the insured, fully compensating him for all loss. We overlook the fact that our tremendous fire loss, plus the cost of operating insurance companies, is borne by all of us in the way of insurance premiums and that this amount constitutes one of our greatest national expenditures. Only a few years ago the average insurance agent took very little interest in the subject of fire prevention, the fact of an increase in fire loss being used by him as an argument to his clients to take out more insurance. The progressive insurance agents of to-day, however, take a different view of the matter, and President F. J. Fox of the National Association of Insurance Agents says:

"Although it may seem to the short-sighted agent poor business to recommend to an insured that if a certain pile of rubbish is disposed of, the rate can be reduced from $1.25 to 13 cents, as a matter of fact such advice is a part of the duty every agent owes to his clients, even though such advice may reduce the actual premium rate involved."

He further states that:

"It is a notable fact that the press of the country has been active in aiding communities to reduce their fire losses, and it is absolutely essential that reputable agents throughout the country cooperate with every ounce of energy to the same end."

The Part Played by the Water Department

The success of a fire prevention program will be due in no small measure to cooperation on the part of the water-plant superintendent, and his first duty will be to see that his property is fully equipped to furnish adequate fire protection service. This may require the expenditure of a considerable amount of money, but the value of the adequate fire protection service will far outweigh the fixed charges on the extensions and additions necessary to bring the plant up to a point where it can furnish excellent service. The Committee on Fire Prevention and Engineering Standards of the National Board of Fire Underwriters of New York has made a large number of reports on the water departments of the country, and if its suggestions are carried out, these fire and water departments would be in position to furnish excellent service and we would to the fullest extent cooperate in the fire prevention program. During the past fifteen years, the National Board of Fire Underwriters has made several reports on the Indianapolis Water Company's property, and we have found these reports exceedingly valuable in that they have pointed out our weak spots and have guided us in mapping out our future extensions and additions.

A high fire loss in a city raises a question as to the integrity of the water-plant to the same degree that a high typhoid rate raises a question in the minds of the people as to the purity of the water-supply. These assumptions on the part of the public are not entirely true, but nevertheless they exist in the minds of many of our citizens. The up-to-date water-works official has made every effort to eliminate typhoid, and he should work just as hard toward the elimination of preventable fires. If a fire prevention campaign has been inaugurated in this city, he should cooperate with it; if none has been inaugurated, he should initiate one and do his utmost to carry it through to a successful conclusion.

Acting on this principle, and on the invitation of W. J. Curran, of the Indianapolis Salvage Corps, and E. M. Sellers, manager of the Indiana Inspection Bureau, the writer suggested to the Indianapolis Chamber of Commerce the formation of a Fire Prevention Committee. This was done in the early part of April, 1921, and the writer was made Chairman of a Fire Prevention Committee consisting of about 1,200 Indianapolis citizens. At the outset, we made a most careful study of our fire loss and were amazed to find that it had increased from a per capita loss of $1.75 in 1910 to a per capita loss of $5.10 for the year 1920, and that the average Indianapolis citizen

had increased his careless habits in a greater ratio than the city had been able to increase its fire-fighting facilities. Our investigation showed that in the year 1910 our city had 5.8 fires per thousand population, and that this had increased to 10.7 fires per thousand population during the year 1920. After going into the matter with great care, we determined that this great fire loss could not be checked by any campaign of one week or one month, and when our campaign was launched we went into it determined to spend four or five years if necessary, to achieve the results for which we were working, namely, a cleaner and healthier Indianapolis with an exceptionally low fire loss. At the outset of the 1921 campaign, the city evidenced its interest by defraying the expenses of the fire prevention campaign, and during the 1921 campaign—and the same will be true of the 1922 campaign—not one dollar was put up by any one who might in any way be interested from an ulterior motive. The Fire Department and, in fact, all city departments, have cooperated in an exceptionally fine way and have done their utmost in the cause of fire prevention. No finer service has been rendered by any one than that rendered by the public and parochial schools, and a large measure of the success of our campaign has been due to the exceptionally fine cooperation accorded by these organizations. Through the instrumentality of thousands of fire prevention essays, programs, and many talks by teachers, the subject of fire prevention is being taught to the younger generation, and it is our firm conviction that within a few years a careless people, and a consequent high fire loss, will be unknown.

The churches, Sunday schools and civic clubs have at all times taken a lively interest in the subject of fire prevention and have given much publicity to our campaign. The Board of Sanitary Commissioners took upon its shoulders the burden of removing all rubbish and refuse of any kind which had accumulated around the homes. About 250,000 pieces of fire prevention literature were distributed, and fire prevention cards are still hanging in thousands of Indianapolis homes. Added to this cooperation from the city officials, schools, clubs, etc., was the exceptionally fine cooperation from citizens in general. The net result of all of these efforts during 1921 was a great decrease in our fire loss and a surprisingly large decrease in our loss of life. Our 1921 fire loss showed a decrease of $550,000, as compared with 1920, and from April 1, 1921, to the present time but one person has been burned to death in the city, instead of our usual annual loss of from 12 to 20. The greatest result, however, of the 1921 fire prevention campaign was the laying of the foundation for a greater fire prevention effort, and the 1922 program holds promise of even greater success than was attained in 1921.

Conserve Our Resources

The depletion of our resources by fire is in itself an exceedingly serious matter, but the seriousness of the financial loss is greatly exceeded by the seriousness of our loss of life due to fire. The 1920 figures show that 15,219 persons were burned to death in the United States and 17,641 were seriously injured; 82 per cent of the dead and injured were mothers and children, and 92 per cent of the fires that caused these fatalities were the result of carelessness or negligence. Carefully prepared statistics indicate that approximately 80 per cent of all the fires occurring in the United States are preventable.

The 1922 Program

Generally speaking, the 1922 campaign is divided into five separate and distinct campaigns, namely:

"Let's Clean 'Er Up" Campaign, running from April 3 to April 29
Fire Resistant Roof Campaign, April 12 to May 13
City Beautification Campaign, May and June, closing with the awarding of prizes on June 15
Clean-up and Fire Prevention Publicity Campaign, October 2 to October 16
No Accident, No Fire Week, November 1 to November 8

After mapping out the 1922 fire prevention program, we received a pledge of active cooperation from the new city administration, and the Mayor, and every department of his administration, are giving unqualified cooperation. The City Council appropriated funds to carry on the campaign, and the program was launched with the assurance of city-wide support. We distributed a large amount of "Let's Clean 'Er Up"

literature, and the newspapers gave much space. As a result, our city has experienced the best clean-up in its history, and inspectors from the Fire and Police Departments inform us that they are finding it necessary to serve but very few official clean-up notices.

Prohibit the Shingle Roof

During the months of January and February of this year, the city had occasion to realize the absolute necessity of the elimination of the shingle roof, which, according to the Fire Chief, is our greatest fire hazard. We have approximately 60,000 buildings covered with wooden shingle roofs, and during the first two months of this year there were 850 shingle roof fires, the maximum number for any one day being on February 16, when there were 63 fires, every one of which was due to a defective flue or to sparks on a shingle roof. We have a city ordinance which prohibits the use of wooden shingles on new buildings, and provides further that if 50 per cent of a roof is damaged, the entire roof must be replaced with a fire-resistant roof. This ordinance, however, fails to specify a time when all shingle roofs must be replaced with fire-resistant roofs, and the change is therefore very slow. A great many cities have rigid ordinances in reference to shingle roofs, and the value of these ordinances will be realized when we compare our record of more than 1,200 shingle roof fires in 1920 with the record of New Orleans, where there were 24; Cincinnati, 56. Louisville, 110; St. Paul, 99, and Philadelphia, 110. We held a large number of conferences with the Indianapolis roofers and explained to them that if the campaign to eliminate the wooden shingle roofs was successful, it would be because of the cooperation of the roofers, and that in order to cooperate it would be necessary for them to do three things:

1. Educate the public to the fact that good roofing is an asset, whereas inferior roofing is a liability
2. Put on good roofing at a fair price
3. Put on good roofing on the payment plan

Practically all the roofers are cooperating in a fine way and have assured us that they will do everything in their power to further this program. Some publicity was carried in the papers in the latter part of March in reference to the absolute necessity of eliminating the wooden shingle, and we prepared to launch a strenuous campaign from April 12 to May 10. The public, however, beat us to the proposition, and roofers in Indianapolis have all the work which they can possibly handle for some time. The Building Commissioner is issuing from 35 to 60 re-roofing permits every day.

Replacing Rubbish Piles with Gardens

A city beautification campaign is being arranged, on the theory that if a rubbish pile can be replaced with a flower-bed or vegetable garden, there will not be much liability of another rubbish pile growing on or near that place. In other words, we hope to make a geranium or tomato grow where rubbish formerly flourished. An organization is being perfected in every ward, with two chairmen, a man and a woman, and 200 or more ward workers. The plans contemplate a yard beautification contest with fifteen or more prizes for each ward and 800 certificates of merit to be distributed throughout the city. Approximately one-half of the prizes and certificates of merit will be awarded for the best yards, and an equal number for the yards showing the greatest improvement. In addition to the ward prizes, there will be 15 to 25 major prizes to be awarded by the Mayor for the most beautiful lawns and premises in the city. We are availing ourselves of the services of the Park Department, City Planning Commission, Board of Sanitary Commissioners, all of which have to do with the general appearance of the city.

The Committee on Laws and Ordinances is giving careful attention to the preparation of a city ordinance making rigid provisions for the elimination of the shingle roof, and is also preparing a bill for presentation to the next Legislature, covering personal liability for preventable fires. We are just beginning to realize the length and breadth of a fire prevention program, and our experience indicates that it achieves the following results for a city:

1. Makes for better health conditions through the instrumentality of clean-up programs
2. Decreases fire loss
3. Decreases the loss of life due to fire
4. Is essentially a Safety First Campaign
5. Makes a city beautiful through the elimination of rubbish piles, dilapidated buildings and other fire hazards
6. Makes better American citizens

The Parable of the Three Roads

Why Adequate Plant Inspection Is Necessary to Insure Good Bituminous Roads

By Francis P. Smith
Consulting Paving Engineer, New York City

LET us assume, for the minute, that we are in the position of an engineer who has not specialized in bituminous construction. Certain contracts have been let in his district for asphalt pavements. His appropriation is more or less limited and perhaps he is doubtful as to the real necessity for plant inspection. After the foundation has been laid and is ready for the bituminous top, he visits the plant. He finds it in operation, apparently running all right, the batches being turned out and the sand assembled and fed to the dryers; the trucks are leaving with fair regularity and the mixture looks all right. It is black and the sand seems to be fairly well coated. He takes a sample from the load and tests the temperature and finds it comes within the limits of the specification requirements.

From there he goes to the road, where he finds the trucks delivering the hot asphaltic mixture. It is being shoveled, spread and rolled in good workmanlike manner, and he comes back to his office and thinks: "What real necessity is there for an inspector at the plant? Everything seems to be going all right, and why visit the plant more than once a day and the street occasionally? Why is not that sufficient?" And so he lets it go at that, and if he is fortunate enough to get a good pavement, he is liable to come to the conclusion that plant inspection is not a necessity, but a more or less expensive luxury which can be omitted when appropriations are scanty.

There is another side to the question, however, and as I firmly believe it true that we learn more from our own failures and mistakes than from any other source, I am going to cite certain failures which were wholly due to inadequate inspection, as possibly the best way of emphasizing the point.

Fortunately for my illustration, within the last three years three failures of bituminous pavement have come to my attention. In all these cases it happened that I was entirely familiar with the circumstances attending their construction, the kind of materials used, and the personnel of the contractor and the engineers under whose direction the pavements were laid.

In the first case the engineer decided to limit his inspection to daily visits to the plant and street, supplemented by a daily analysis of a sample taken when he visited the street. Instead of a complete analysis, he determined the bitumen content only, on the theory that the amount of asphalt that went into a bituminous road was one of the most important elements to check up, and that as the asphalt was the most expensive ingredient of the pavement, he would be more likely to find a shortage there than in any other constituent. In this instance he was drawing on his experience in concrete construction work.

In the second case the engineer decided against complete inspection, but he or one of his assistants took a daily sample of the mixture and had a complete analysis made of it.

In the third case the engineer was convinced of the necessity of plant inspection and he assigned a good inspector to cover the plant and had daily complete analyses made of the mixture, but he thought the street gang could get along all right.

In the first case a single sand was used and this sand had been examined carefully and approved as suitable for the construction of a sheet asphalt pavement. In the second case two approved sands were used and they were supposedly mixed in the proportions designated by the engineer. In the third case only one sand was used, there was practically no street inspection, and the street gang was composed of unskilled and incompetent men. Still keeping the preliminary conditions in mind, let us inspect these roads after they have been completed and subjected to traffic for various periods of time.

The First Road—Skimping on Bitumen

In the case of the first road, the time will be four months. We find a small portion of it in excellent condition, a part of the remaining portion is scaling badly, and the rest of the pavement is both wavy and scaly. What really happened was this: An examination of the pavement from the different portions of the street showed very clearly that the portions of the pavement which were in fairly good condition carried about the normal percentage of bituminous material. The portions of the pavement that were scaling, instead of carrying between 10.5 and 11.5 per cent bitumen, carried on the average only 8.5 per cent. The portion which was "shoving" had about 9 per cent of bitumen. The analyses of this pavement made by the engineer all showed a bitumen content running between 10 and 11 per cent. These samples were taken by the engineer on his daily visits to the street. It developed on further investigation that, owing to the pressure of other work, the engineer regularly paid a visit to the street between 10 and 11 every morning. Therefore, the men at the plant and the men on the street, after that visit between 10 and 11, knew there would be no further visits made that day and no other samples would be taken for analysis. It was very easy, therefore, for them to run during the early portion of the day a mixture which contained the normal percentage of bitumen, regardless of what they did afterward.

It was also the case in this particular pavement that the contractor to whom the job was awarded was a man who had had a good deal of experience in public work, a man who stood very well with the administration, but this was his first attempt to lay a bituminous pavement. He was brought up in a school where anything to increase the output of the work could very often be gotten away with, and such methods often did not seriously damage the final result; being ignorant, he had to rely on the advice of the men he had hired for the job on the street and at the plant. They tried to make a low cost record for themselves by saving asphalt when they thought it would not be detected, and by speeding up the plant. The deficiency in bitumen was one of the causes for the failure. Another cause was the fact that the pavement was insufficiently compressed, the rolling was done superficially, and the finished pavement had a density of between 1.85 and 1.89, which is much too low. An examination of certain portions of the pavement which were defective showed that not only was the bitumen content low, but the grains of sand were insufficiently coated. That led to an investigation of the record as to the daily output of the plant.

The plant had an ordinary 9-cubic-yard mixer which turned out a batch of 1,000 pounds of material. The specifications, backed up by the requirements of good practice, called for at least one minute's mixing in the mixer, the revolutions of the shafts between 60 and 80 per minute. An experienced mixing crew, trained to the last minute and entirely competent, can probably turn out one batch of mixture every minute and 20 seconds and give a full minute's mixing to each batch. An exceptionally well-trained crew can, throughout the day, average one batch in 1 minute and 30 seconds. Giving the contractor the benefit of the doubt and assuming his crew to be an exceptional one, that would make 40 batches an hour. A thousand-pound batch will lay 5 square yards of 2-inch pavement, so the maximum output which could be allowed to a contractor doing his work properly and giving it the required time of mixing, would be 200 square yards per hour. In this particular case the work was prosecuted with a 9-hour plant day. That gives us 1,800 square yards per day as the maximum output for that plant.

We found on investigating the records that 2,500 or 2,800, and even as high as 3,000 square yards had been laid per diem, which meant that the mixing was cut fully in half. That accounted for the insufficient coating of the sand grains, and, combined with the lack of rolling and the low percentage of bitumen, accounted entirely and wholly for the failure of that pavement in four months. The traffic on that road was heavy. The foundation was of concrete 8 inches thick, and the subsoil was properly drained. There was no question of improper foundation or improper drainage. Further investigations involving a pretty close approximation of the daily amounts laid and their relative service records after the four months showed, in those cases

where it was possible to trace them—which was about 30 per cent of the time—that the pavement laid in the period from early morning up to 11 o'clock has given very good satisfaction. That illustrates as plainly as words can tell what took place after the engineer had paid his daily visit and the contractor felt himself freed from further supervision for the remainder of the day.

An inspector at the plant would have verified the weights of the mixture. He would have verified the time allotted to mixing. He would not have permitted them to reduce it, and the mixture sent to the street would have been of uniform bitumen content, and his temperatures would have been properly maintained. The cost of that inspector at the plant weighed against the indirect cost to the city through the inconvenience to the public while taking up and replacing that pavement, and the cost of a new pavement, which will fall directly on the contractor, would have paid for ten inspectors at the plant ten times over.

The Second Road—Mixing Two Sands

Now let us visit the second road. In this road two sands were used, one a coarse sand, and one a fine sand. In the fine sand the particles were almost wholly composed of quartz. They were very sharp and had rough surfaces to which bitumen adhered well. The coarse sand was partly rounded, and if used by itself would not have made a stable mixture. It was, however, the only coarse sand available in that location at anything like a reasonable cost, and not more than 33 per cent of it was required in the mixture. A mixture made according to these proportions would have had sufficient stability and would be in all respects an excellent mixture. In this case, you will remember, daily samples were taken by the engineer on the street, and the analysis that was made involved only the bitumen contents. The contractor was a man who had had very considerable experience in the laying of sheet asphalt, a man of high business honor and integrity, and he tried honestly to lay the best pavement he knew how. The plant foreman was very good in some respects, but slack in one particular. That one particular was fatal. Two years after that street was laid, possibly one-half of the pavement was in good condition and the remainder was waving badly. The cause for the defective portions of the pavement was clearly traced to lack of care in the mixing of the sands. The established proportion for the sands was two of fine to one of coarse.

If you have had experience with asphalt plants, especially at the start of a piece of work, you will realize how very difficult it is to get men to keep their coarse sand piles separate from the fine sand piles and to establish a system whereby the sands will be mixed in the right proportion. In this particular case the coarse sand was very much cheaper than the fine. The plant foreman, thinking to do his employer a good turn and reduce the cost of laying the pavement, tried to use all of the coarse sand possible. That policy was carried so far that possibly one-half of this pavement was laid with all coarse sand and no fine sand in it. The analyses showed that the bitumen content of that pavement ran uniform. The men on the mixer did their duty, using the same amount of sand and the same amount of filler; they kept the mixture uniform in these respects, and the engineer congratulated himself that this pavement was more uniform than the average, and he expected the best results from it.

When we have a pavement with a given bitumen content composed of a large aggregate, we have one in which the surface is more thickly covered with bitumen than in a pavement of the same bitumen content which is composed of a fine aggregate. In this particular case, when using the coarse sand alone, the mixture containing 10.5 per cent bitumen probably carried over 1 per cent excess of bitumen, which was further aggravated by the fact that the rounded grains had a comparatively smooth surface. The result was a pavement which markedly lacked stability, and under heavy traffic it became wavy and shoved badly. In this case, the entire failure was due to not mixing the sands properly. An inspector at the plant who was competent and faithful would have kept an eye continually upon the men who were feeding the sand to the drum, and would have seen that the coarse and the fine sands were mixed in the proper proportion. Had he done so, that failure would not have occurred, thus saving much trouble.

The Third Highway—Density Not Uniform

In the case of the third highway, which, again, was a main trunk line route, it also had a 6-inch concrete foundation and a subgrade more than ordinarily well-drained, and only one sand was used. An inspector who was in every way competent was present at the plant. The analyses were complete and showed a mixture with a variation that was well within the average limits of departure from the standards set by the specification. In other words, the mixture was better than the average. The portions of the road that were laid in the early part of the season showed at the end of two years a very decidedly wavy condition. Portions of the road which were laid toward the latter part of the season were as perfect at the end of two years as on the day they were laid, if not better. Here was a case where the mixture was not at fault, but what happened was this:

In the early season the contractor had difficulty in getting a competent gang for the street. He had a poor roller man. He also had a four-mile haul from the plant, and the men who shoveled the material after it was dumped from the wagon were untrained, and rakers and shovelers trampled upon the mixture while it was being spread. Complaint of that very condition was made to the engineer having charge of the work, but it appeared to be somewhat of a hardship to the contractor to expect him at the very start of the season to have a gang that was well-trained and would fall into their places as they should. So, for a period of thirty days, workmanship on the street was tolerated which was not in accordance with the best practice, but which would, possibly in 50 out of 100 cases, have resulted in an entirely satisfactory pavement. As is always the case, those portions of the street where the mixture had not been properly raked and fluffed up, contained places where the density of the pavement was greater than those parts immediately adjacent thereto, and when the roller passed over them there was left a pavement which did not have the same density throughout. The compression exerted by a heavy truck is greatly in excess of that which can be obtained with a steam roller, and the concentrated traffic on that particular road found those spots that were less dense than others and began to depress them. Under modern motor traffic a depression once started quickly grows and gives rise to other depressions, until a series of waves is formed, with disastrous results which are familiar to us all.

Safety Dependent on Inspection

The three roads in question were paved with sheet asphalt with 1½ inches of binder course and 1½ inches of surface mixture. In a normal sheet asphalt mixture, a total variation of 1½ per cent from the standard bitumen content desired is not necessarily fatal to the road or even extremely detrimental, so that with this type of pavement a certain amount of inaccuracy in weighing the ingredients can be tolerated without specially bad results. But in a great many sections of this country they lay what has been called Topeka mix, which is more or less of a hybrid. It was originally a sheet asphalt mixture containing a small percentage of stone, small enough in quantity and size to avoid the Warren Brothers' patents. The Warren Brothers had really covered the best possible grading for a coarse mineral aggregate in a bituminous pavement. There has been objection to laying a patented pavement, and in order to get around that, they tried to lay this pavement which had only a small amount of stone in it. A great deal of this kind of pavement has been laid. Some of it has given very good results. In some cases its use has been justified by the fact that stone is cheaper than sand; the more stone, the cheaper the aggregate will be and the less will be the amount of bitumen required, and, therefore, a considerable reduction in the cost of the pavement will be effected. The limit of variation in bitumen contents permissible in a Topeka mixture is, however, very much smaller than that which is permissible in a sheet asphalt mixture; therefore, more careful watching is required on the part of the platform mixing gang, and greater accuracy in the weighing of the asphalt and the other ingredients of the batch.

When you think of men in a cloud of dust that at times is almost unbreathable, turning out 40 batches an hour all day long, one wonders that they do as good

work as they do, and it also becomes a matter of wonder how an engineer, having in charge a pavement involving 40 batches an hour separately weighed, could possibly go on without an adequate plant inspector and yet feel that the safety of the project was reasonably insured.

Temperature of Batch

There is another point I should like to discuss, which was not involved in the case of these three roads mentioned, in order to illustrate another vital reason why an inspector should always be present at the bituminous mixing plant, and that is, the question of temperature. A test of the temperature of the mixture as it leaves the plant or as it reaches the street is not sufficient. In making the mixture we have two elements which are heated, the mineral aggregate and the asphalt cement. If we overheat the mineral aggregate and have a cool asphalt cement, we have in the finished product a mixture which will come within the requirements of temperature, but we shall have injured the mixture, because the mineral particles carry only a very thin film of bitumen and, if heated beyond the danger point, this thin film of bitumen will harden very rapidly. If, on the other hand, the sand or stone has been saturated with moisture by heavy rains, the capacity of the drum for drying and heating the mineral aggregate will be reduced. Under such conditions, a foreman anxious to turn out a large output is tempted to overheat his asphalt to offset the low temperature of his heated aggregate, thus increasing the amount of mixture of normal temperature delivered by the plant. Such a mixture will be defective owing to undue hardening of the asphalt in the kettles, and the bond between the bitumen and the sand will probably be weak.

Selecting the Sand

In many cases, sand, which forms 75 per cent or more of a sheet asphalt pavement, is obtained from large pits that are operated by experienced men, and they deliver a uniform supply which requires very little inspection to insure the use of suitable sand in the mixture. In other cases, the contractor frequently opens up his own sand-pit. Oftentimes stripping is required, and the face of the sand-pit is found stratified, fine and coarse. Sometimes it is necessary to discard a layer 2 or possibly 3 feet deep at the top in order to get a proper grading for the mineral aggregate. The contractor hires teamsters and places a man at the pit with a scraper, and he instructs these teamsters to go to a certain portion of the pit and take the sand from there. The local teamster knows that the more loads he gets the better he will be paid, and he takes the sand from the easiest or nearest part of the pit. The consequences are that half the loads should have been rejected. In other cases, where coarse and fine sands are mixed, it is very difficult to get the contractor to keep the sands separate. The drivers are careless and dump fine sand on the coarse pile, and vice versa, and there is no possible way of separating and grading the sands properly. The consequence is that the mineral aggregate varies so much that it does not come within the limit of the specifications or good practice, and, even if it does happen to fall within those limits, the variation is still so great that in order to secure the best results, the bitumen content should be varied. This it is impossible to do satisfactorily.

The aphalt cement in former days used to be made at the plant by fluxing a hard asphalt, but to-day most of the large asphalt manufacturers send tank cars that are tested, either before they leave the plant or on delivery. The variations in penetration are very trifling and do not require to be tested more than once per tank car delivery, instead of once for every kettle filled at the plant, unless the contents of the kettles are kept under heat for a very long time.

ACKNOWLEDGMENT.—From a paper read at the Eighth Annual Conference on Highway Engineering at the University of Michigan.

Maintenance Cost of Brick Roads

It cost the state of Illinois, in 1919, $42.63 a mile to maintain 86.9 miles of brick highways, exclusive of roadside up-keep. Including this item, the total cost per mile for brick was $118.79, compared with $149.86 for another type and $334.80 per mile for a third. Gravel and earth roads are not included.

Milwaukee County Police Abolish Speed Traps

By J. B. Scott

THE motor-cycle police of Milwaukee County, Wis., have set a splendid example to other motor-cycle organizations throughout the country by appearing upon the county highways in full police uniform. Furthermore, they officiate in a manner which adequately informs all motorists that they are motor-cycle police and not operators of speed traps awaiting the unwary motorist who chances to infringe on the speed laws of their vicinity. This is in accordance with the principles laid down by the County Sheriff, Patrick McManus, at the beginning of the 1922 motoring season. This movement on the part of Milwaukee County should be copied by all counties in the United States where motor-cycle police are employed in any way whatsoever. Some of the big cities have tried out the idea in their city police squads and have found it to be the very best method of law enforcement.

After all is said and done, prevention is better than prosecution, and primarily this is the reason for the change of tactics in the Milwaukee county police. Sheriff McManus states that it is his belief that law and order on the road can be better preserved by having his men operate as officials and not in the guise of plain-clothes men.

There are many county and state police organizations throughout the country that act in a manner unbecoming public officials. They not only lie in wait for the unsuspecting speeder, but do everything in their power to prepare the way for speeding. The reason for doing this is very evident. Their salary in many cases is contingent upon the number of arrests they make, and naturally they are going to make as many as they can. This last is particularly true of certain cities wherein the speed cops officiate only on Saturday and Sunday and exact a weekly revenue from tourists chancing to come their way.

Judging from the number of complaints registered, the season of 1921 was a banner year for this type of unscrupulous police. Naturally, tourist traffic means much to any state or city of the Union, both in the way of national advertising and in cold cash spent in that particular state or city. Also motor-cycle police operating under a disguise without uniform or badge are a detriment and a sure cause for failure of any state or city advancement plans so far as the tourist is concerned.

The method suggested is the only safe and sane method of eliminating speed. A uniformed motor-cycle policeman patrolling a road will do more to stop speeding than ten motor cops hiding in ambush waiting for the speed demons to rush by and then rushing after them.

Motor-cycle Police to Welcome Visitors

A very appropriate suggestion has been made, that each motor-cycle policeman be allowed to officiate as a committee of one to greet all visitors to the community. Virtually every community caters to tourist trade in some degree. Instead of pouncing upon them and arresting them upon the slightest provocation, have the motor police welcome them to the community, state the regulations enforced there, acquaint the visitors with the places of interest and furnish any information desired. A hearty welcome has never injured anyone, particularly the party doing the welcoming. With this system in vogue throughout the country, the communities represented will have gained another step toward their goal—the making of the particular community a tourists' paradise, not only from the standpoint of natural beauty, but of courtesy and hospitality.

The road builder who tries to "pave with good intentions" has engaged in the contracting business in the wrong locality. —*Highway News Digest.*

East Cleveland Street Lighting Combines Good Appearance and Effective Illumination

By C. M. Osborn
City Manager, East Cleveland, Ohio

THE circumstances leading up to the installation of a new electric street lighting system in East Cleveland were no different from those arising in other cities, particularly during the past decade. Motor vehicle traffic had increased tremendously with a corresponding increase in the accident hazard, many new residential districts had been opened, and finally, civic pride demanded a lighting system which would be on a par with other improvements of which the city boasted. The lighting system must, therefore, satisfy two general requirements—utility and beauty.

Unlike the ordinary city of its size, East Cleveland has no centralized business district which would seem to require the usual "white way" system; numerous small neighborhood shopping districts are scattered throughout the city. Euclid Avenue, a continuation of one of the principal streets in Cleveland, traverses the entire length of the suburb and acts as a main artery to the larger city. Other thoroughfares of somewhat less importance are also found leading off into state and county highways. Intermediary streets of a residential character connect the thoroughfares and, peculiarly enough, most of them do not follow through as street intersections, but simply lead into the thoroughfares. For the purposes of lighting, two classes of streets are therefore established —thoroughfares, and others almost entirely residential. The foregoing is given as having a bearing both on the location of lighting units and the amount of light supplied.

Locating the Units

The location of lighting units was made with particular attention to definitely establishing the point where the residential street leads into the thoroughfare. Records of traffic accidents showed that the hazards at such locations were especially great. Therefore, a lighting unit on the thoroughfare is placed on the side of the street directly opposite the end of the residential street. This arrangement not only marks the thoroughfare for the approaching

ARC LAMPS SUSPENDED FROM MAST ARMS WERE USED PRIOR TO THE PRESENT INSTALLATION

motorist, but also affords him ample light for turning into the heavier traffic.

There are in use in the new system approximately 900 incandescent lamps. On Euclid Avenue 93 1,000-c.p. lamps are used, spaced approximately 140 feet apart. On the minor thoroughfares, depending upon the amount of traffic to which the street is subjected, 400- and 250-c.p. lamps are used on a spacing of about 200 feet. In the residential district 150-watt (approximately 200-c.p.) multiple lamps are employed, staggered and spaced about 200 feet between units.

The staggered arrangement with units on both sides of the street was adopted for both the thoroughfares and the residential streets, for it soon developed that it would be practically impossible, particularly in the case of the wide thoroughfares, to properly light such streets with only one row of lamps. With two rows of units, each side of the street is lighted, in effect, as a single street of half-width. The staggered feature is especially effective in lighting for the benefit of pedestrians, since a part of the light from any given units is directed across the street to the area of comparatively low illumination midway between units on that side. Furthermore, by bringing the light to any point from several directions the staggered system very materially reduces shadows from trees and other objects, thus preventing dark hiding-places.

It is a well-recognized fact that the wood pole and mast arm bringing the light source out over the street surface has been very satisfactory from the standpoint of lighting efficiency. Its appearance, however, with its dangling wires, has always been offensive to the eye, particularly on a well-kept street. On the other hand, the usual ornamental standard, about 10 feet in height with opal globe, is made up in a pleasing design, but its efficiency is comparatively low, for fully as much light goes upward as is directed to the street. The East Cleveland lantern with its ornamental standard and bracket arm, mounted at a minimum height of 16 feet, is a decided departure from anything so far designed in residence street lighting equipment, for it actually combines high efficiency and favorable appearance. The greater height proportionately increases the spread of illumination from each lamp and makes possible the same uniformity of lighting with fewer units than are necessary with low mounting heights. Furthermore, the lamps are removed from the ordinary line of vision, and the glare effect so often found in units at lower heights is eliminated. The liberal length of bracket arm brings the unit out so that it clears the tree foliage. As a result, even at a height of 16 feet, the interference from tree foliage becomes less than where short, upright posts are used in an attempt to keep the lighting units below the tree foliage. The appearance of the ornamental lamp standard can be judged from the photograph, and some idea of its efficiency as compared with the upright standard and opal globe can be gained from the diagram.

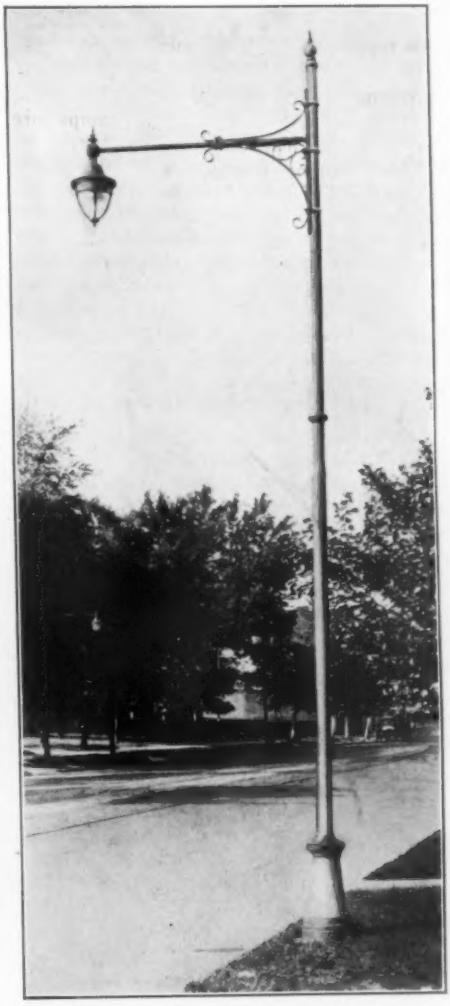
For the principal thoroughfares, the bracket arm extends 6 feet out from the supporting post, and the lamp is mounted at a height of 20 feet above the surface of the street. For the streets of a residential character, a smaller standard is utilized which brings the lamp 16 feet above the street with a 4½-foot bracket arm. The standards and brackets were furnished by the Union Metal Manufacturing Company, Canton, Ohio.

Except where there are levels of illumination of the order of those used in white way street lighting, considerable dependence must be placed upon seeing objects in the street at night by silhouette effect; that is, objects which are not in themselves lighted brightly enough to be easily seen are likely to be revealed as dark silhouettes against brightly lighted areas beyond, such as the spots of light beneath the street lamps. However, these bright spots of diffuse reflection are not found in the case of streets subjected to heavy continuous traffic, where the pavement soon acquires a black polish from the action of the tires and the oil from engine exhausts. On streets in this condition, or on any paved street that is wet, the bright spots beneath the street lamps practically disappear and the rays from the street lamps are spectacularly reflected by the surface, forming paths of brightness or glint from the pavement. From the nature of this glint effect, it is not possible to develop a sheen covering the entire pavement of a wide street from a single row of lamps. However, with a bracket system having lamps on each side of the street, spaced not too

widely, these paths of light or glint merge into one broad strip, giving a sheen of brightness covering practically the entire pavement and producing thereby a bright background against which objects may be seen in their true outline with such distinctness that an automobile driver may readily locate them and estimate their rate of speed and direction of travel. The bracket arm has the further advantage that by bringing the lantern out over the street surface the vertical faces of the curbstones are lighted on both sides of the street, and the street boundaries are well defined.

The Novalux lighting unit of the lantern type construction was developed for East Cleveland and is manufactured by the General Electric Company. One of the most desirable features of its construction is the fact that the whole unit is entirely enclosed. The joint between the globe and canopy is formed by a tight felt seating. This insures the absence of the usual collection of bugs and dirt found in many fixtures of this general type. A Holophane prismatic glass refractor is seen surrounding the lamp bulb. This serves to direct the upward light from the lamp downward, and fully 50 per cent more light is made useful on the surface of the street than would be the case with the ordinary opal ball. Less light is of course directed to the porches and upper windows on residence streets, thus alleviating the discomfort often experienced where no attempt has been made to direct the light to useful directions. The lamp and refractor are totally enclosed by an acorn-shaped globe made of rippled glass, which gives the unit a live, sparkling appearance. The globe merely spreads and softens the light rays and does not materially affect their direction. The function of the rippling on the globe can be likened to that of the nozzle on a hose, which breaks up the solid stream of water into a softened yet well-directed spray. This outer globe is held in a basket of copper bands. In the case of a broken globe the basket obviates the danger from falling glass. When the unit is lighted, these bands give the globe a definite shape and prevent the impression of a bright spot of light shading off indefinitely into space.

The illumination results effected by the new system may be briefly summarized as follows: The illumination on the thoroughfares is such that it will enable an automobile driver moving at a rapid rate of speed to easily see a grown person or child in the street or about to step from the curb into the street. Small obstructions or depressions in the street are plainly visible. The direction and rate of speed of other vehicles can easily be judged. Passengers are able to quickly gage their footing in getting on or off street cars, and it is possible to read written addresses at any point on the street.



THE EAST CLEVELAND STANDARD AND LANTERN

On the residence streets on which there

is no great amount of through traffic, the requirements are somewhat less exacting, and therefore a somewhat lower level of illumination was considered adequate. Obstructions or serious breaks in the pavement, or children playing in the street, can readily be seen by an automobile driver when going at a fair rate of speed. Turns, dead-ends, and street intersections are definitely marked. The illumination shows inequalities in sidewalks, eliminates heavy tree shadows, and reveals street signs and house numbers. Enough light is provided on the front lawns and between houses to avoid dark hiding-places.

Unique Power Circuit

An unusual innovation found in the new East Cleveland street lighting system is that all lamps in the residential districts are fed from the house lighting circuits which run along the rear lot lines. The common practise in the past has been to install a separate and distinct series system for street-lighting current distribution, controlled from the power-station. Such a system in the residential parts of East Cleveland, if installed underground in the usual way, would have necessitated the digging of curb-line trenches which would have run fully 200 feet for each lighting unit. The cost would have been further increased where concrete driveways were encountered, and the pavement would have been torn up to reach the lamps of the staggered system. Since the residence lots were only 130 feet deep, it is seen that a material saving was effected by simply making a trench run along the side lot lines to the street. Contrary to the misgivings expressed by a number of interested persons, little difficulty was encountered in securing easements for the underground construction of lines, since the property owners were fully convinced of the better appearance of the ornamental system with underground distribution as compared with the usual overhead wood pole line construction. With the multiple arrangement of distribution it was merely necessary to provide time switches for turning the lamps on and off. As many as ten lamps are controlled by one switch.

Practically all the wiring is placed underground for both thoroughfares and residential streets. Unsightly poles and overhead wires are therefore eliminated throughout the greater part of the city. This one feature has probably been the most popular of any in the system, and as far as the appearance of city streets is concerned it can be considered at least as important as the selection of a lighting standard and unit of pleasing design. Because of the large economies effected by the utilization of the multiple house-lighting circuits to supply energy, and the resultant practice of low-voltage underground distribution along the lot lines with inexpensive cables and short runs, the total cost was but little more than that estimated for an overhead series system.

Cost figures on street lighting systems are likely to be misleading because of the variance in conditions encountered in different localities. In East Cleveland the total cost of the installation amounted to approximately $100,000. The cost of the new system to the city will be about $45,000 per year, including cost of energy and maintenance, depreciation, and amortization charges. The illumination provided is practically five times that of the system it replaced, although the cost is only a little more than twice as great.

Acknowledgment is made to Messrs. Earl A. Anderson and O. F. Haas, illuminating engineers, Engineering Department, National Lamp Works, who acted in the capacity of designing and consulting engineers, and to the Cleveland Electric Illuminating Company for cooperation in working out the construction and operating programs for the new installation.

Top-Soil Road Construction in North Carolina

THE rational development of top-soil road construction in North Carolina is rapidly giving this state a system of improved highways. The roads are in good condition more than 11½ months in the year and they are economically durable for a traffic of between 400 and 800 vehicles per day. The top-soil roads cost about $7,000 per mile to construct and $400 per mile per year for maintenance. By resurfacing them at a cost of about $135 per mile once in three years, they can be virtually renewed. When the traveling capacity of these top-soil roads is exceeded, they provide remarkably good foundations for pavements of the hard-surface type.

Police and Fire Alarm Cable Circuits in Representative American Cities

Methods of Handling, Cost of Installation and Maintenance Vary Greatly

THE relative cost of installations of underground and overhead fire alarm and police circuits, the types of cables used, and the annual maintenance charges are naturally of interest to all superintendents of fire alarm and police services. Unfortunately, only a small amount of data is available on this important subject. It is of interest, however, to note the various methods employed in different cities in the East in the installation and maintenance of these circuits.

Baltimore, Md.

In Baltimore, Md., the Electrical Commission, organized on October 1, 1898, constructs underground conduits in order to enable the city to enforce in a systematic and positive manner the removal of old and overhead wires which infested its streets and thoroughfares. All corporations are required to occupy the conduits allotted to them upon the receipt of notice that provision for their accommodation has been completed. This does not apply, however, to the telephone company, which under its franchise has the right to build overhead or underground anywhere in the state. The fire alarm and police telegraph systems are entitled under the provisions of the franchise to have space in the conduits or positions on the poles of the telephone company when required. Municipal departments are provided with ducts in the conduits of the Electrical Commission and are required to occupy them and remove poles when notified by the Commission.

The cost of construction and maintenance of the fire alarm telegraph department of Baltimore goes into the general expense account without specific detail of purpose. An estimate of a particular branch of construction, either overhead or underground, which it is sometimes necessary to provide, is easily computed, figures being based on the cost of material and labor. An interesting description of Baltimore's underground conduit systems appears on pages 617-618 of the June, 1916, issue of THE AMERICAN CITY, and another in February, 1918, page 130.

Detroit, Mich.

The Detroit Fire Department has 290,000 feet of conduit, part clay and part fiber, which has cost an average of 75 cents per duct foot, the manholes costing about $75 each. The types of cables used are combination rubber and paper in one sheath, and rubber, lead-covered. The sizes vary from duplex to 100 pairs. The cost for 253,000 feet of cable was $146,483; 700 miles of 3 brd. W. P. copper wire cost $33,220; 3,786 poles cost $37,860, and the fixtures $9,566.

Harrisburg, Pa.

The overhead circuits of the Electrical Bureau of the city of Harrisburg, Pa., which operates under the Department of Public Safety, cover both fire alarm and police signal systems and run entirely on the poles of the public utility companies, so that the only cost to the city is that for wire and boxes. Underground cables are run entirely through the ducts of the several companies maintaining underground structures, a duct in each instance being assigned to the city by the utility in return for its franchise. The cost, therefore, in this instance is only for the cable and boxes and is dependent more particularly upon the size of the cable used. In overhead construction nothing but hard-drawn No. 10 copper wire with weather-proof insulation is used, while in the underground construction only rubber-insulated wire with lead sheeting is used.

Meriden, Conn.

The Superintendent of Signal Service of the Police Department, Meriden, Conn., reports that they do not keep exact records of the cost of aerial and underground construction, all of the work being done by the electrical department of the city. Underground cable is used jointly by the police and fire departments and is made according to the International Association of Munici-

pal Electricians underground cable specifications, with the exception that they use a tape tracer instead of a ridge or fin on the rubber, because in the case of the fin marking it might be misconstrued as a machine mark left from manufacture. Some rubber-covered wire is run underground, being made the same as the wire in the cable, with the exception of having a slicked braid overall and a 1/16-inch wall of rubber. This, however, is not advised and is used on only a few cross-connections, which should not be in use for any length of time.

Fire alarm aerial wire is No. 12 B & S gage, hard-drawn bare. Aerial police box circuits are No. 12 B & S triple braid weather-proof wire. Police recall or signaling circuits, such as gongs, horns, lights, etc., are Nos. 8 and 10 triple braid weather-proof wire. Recall underground cable is of the same construction as police and fire cable, except that the conductors are No. 12 gage. If it were not for the fact that poles are pretty closely spaced, Meriden would probably use nothing smaller than No. 10 for aerial lines. In that locality, however, No. 12 wire answers the purpose.

Niagara Falls

Niagara Falls, N. Y., has been installing fire alarm wire underground since 1913, using combination cable for fire and police wires in one duct of the New York Telephone Company, which is furnished free to the city. The cable is made up in accordance with the International Association of Municipal Electricians specifications, using solid No. 14 wire for fire and police signal and No. 18 twisted pairs for fire and police telephone systems, with conductors to care for the present and future demands in the sections of the city in which it is installed. The Telephone Company pulls and splices the cable at cost, and maintenance has cost nothing since the system was installed underground, with the exception of one defective sleeve, which was replaced. On January 1, 1922, the following cable was in service: 45,636 feet of cable containing 36½ miles of working fire alarm; 22½ miles of fire department telephone wire, and 46 working police signal and flashlight wires. There are 33 miles of No. 10 hard-drawn copper wire overhead for the fire alarm system, which is on a cross-arm furnished free by the Telephone Company. Six miles of wire is being added to the aerial system this year, and about 3,000 feet of cable to the underground system. Cable and wire are purchased each year by competitive bids, and no special record of cost of overhead circuits is kept, as all work is done by the City Electrician and the underground cost is the annual cost of new cables plus the work of pulling and splicing.

Rochester, N. Y.

The Bureau of Fire and Police Telegraph of Rochester, N. Y., uses hard-drawn copper wire of No. 10 gage for overhead construction. Underground cable is rubber-covered, lead-encased and No. 12 gage. In granting a franchise to the New York Telephone Company, the city of Rochester provided that it be given one duct wherever the Telephone Company ran underground and that the company also pipe to the first pole, so that a cable box can be placed and the line run overhead. The cost in this case is the price of the cable plus installation cost. No costs for installation have been kept. On a job just finished, two cable splicers and helpers pulled in 1,200 feet of No. 8 wire cable in two days, testing out the cable and splicing four joints. Where the Telephone Company has no underground conduits, the city builds its own subways, the digging being done by contract, which generally runs about 30 cents per foot, and the manholes at about $40 each. Creosote ducts are being installed this year. In the past, second-hand iron pipe has been used, but it did not prove satisfactory. Two cable splicers and two linemen are employed at salaries of $1,700 per year, and two helpers at $1,250 per year. In Rochester there is cable still in service and in very good condition which was installed 25 years ago. There have been a few cases of trouble with electrolysis in different parts of the city each year, and also trouble due to the men employed by the gas company, in looking for leaks, driving a needle through the cable, thus causing grounds.

Waterbury, Conn.

Only No. 14 gage cable is used in Waterbury, Conn. This cable has a 30 per cent Para rubber insulation, each conductor being plain with a tracer in each layer, jute-filled. It has a ⅛-inch lead wall with 3 per cent tin, and is tested to 4,000 volts and

2,500 megohms per mile. The estimated costs of cable are given in the table below:

150 conductor cable	$1.45 per foot
25 conductor cable	575 per M feet
20 conductor cable	500 per M feet
50 conductor cable	925 per M feet
100 conductor cable	1,250 per M feet
Fire alarm standards, cable boxes and terminals,	$125 each

The estimated cost of drawing in cable, splicing and connecting it is usually figured at 2 per cent of the total cost. Maintenance cost is handled as a special item and covers both line and underground service. The total annual maintenance cost is estimated at $1,500. Conduit cost is estimated at $300 per 100 yards of permanent pavement, and $450 per manhole.

Acknowledgment

We are indebted to the following superintendents of telegraph systems for the information recorded above: J. B. Yeakle, Superintendent of Fire Alarm Telegraph, Baltimore, Md.; Louis Gascoigne, Superintendent, Fire Alarm Telegraph, Detroit, Mich.; C. E. Diehl, City Electrician, Electrical Bureau, Department of Public Safety, Harrisburg, Pa.; Arthur E. Cook, Superintendent of Signal Service, Police Department, Meriden, Conn.; M. J. Donohue, City Electrician, Niagara Falls, N. Y.; Lafayette G. Akey, Superintendent, Bureau of Fire and Police Telegraph, Rochester, N. Y.; Charles K. Ahearn, Superintendent, Bureau of Fire Alarm Telegraph, Waterbury, Conn.

Testing Increases City Power-Plant Efficiency

By W. M. Gray

Commissioner of Public Utilities, Chanute, Kans.

NEARLY two years ago it was decided by the Commissioners of Chanute, Kans., that it would be inadvisable to postpone or defer a radical overhauling and enlargement of the municipal electric light plant. The engines and boilers were badly overloaded, the engine room was small and already crowded with the two small units operating at that time. The building was also in bad condition and it was not feasible to repair it or to enlarge it. The best feature of the plant was the new boiler room, built the year before, and two 250-horsepower water tube boilers installed in the new section. Black & Veatch, consulting engineers, were called in, and investigated the situation very carefully, reporting to the Commission. It was decided to first construct a new building to properly house the old units and to provide space for the proposed new 625-kilovolt-ampere steam turbine, another 250-horse-power water tube boiler, a new spray pond and condenser, stokers and ash conveyors and accessories, which brought the total cost up to about $75,000.

This expenditure was approved at a subsequent bond election. With the money provided, the Commissioners were confronted with the task of wrecking one plant and rebuilding it and keeping up continuous operation at the same time. It was found to be no small job, but was finally carried through successfully. The problem was further complicated by the resignation of the very capable superintendent. The next appointee served only a few months.

When the $75,000 bond issue had been expended in improving the plant, there were three 250-horse-power boilers, two Casey-Hedges and one Heine, equipped with good stokers and ash conveyors. A new 625-kilovolt-ampere Allis-Chalmers steam turbine properly equipped with spray pond and condenser and all necessary auxiliaries, together with the two old units previously mentioned, were installed, and yet it was found that the service had not been improved. The cost, instead of decreasing, had actually increased. This was a condition which demanded immediate action. The services of the present plant superintendent, C. G. Bayles, were secured, and the situation was thoroughly canvassed.

The consulting engineers were again called in, and after numerous conferences it was decided that the leak in cost was in the boiler room. Mr. Bayles began to overhaul the boilers and boiler room to see why the results were not better. He found the boiler room ill-kept and loosely managed, the firemen fighting to keep three boilers going on a one-boiler load, unable to realize why they were securing such meager results at such enormous labor and expense.

The troubles were, in general, as follows: irregularity in the time of cleaning the boilers; careless inspection of boilers when down; seeming ignorance of the primary essentials of combustion engineering; and neglect in the use of proper recording instruments. The consumption of steam was in a similar unsatisfactory condition. No intelligent check on steam generation per kilowatt hour, very careless and unsystematic records of switchboard, and the same carelessness in the records of the vacuum or load conditions throughout the day were noted. So, in spite of a good boiler room and new equipment, great inefficiency was disclosed.

This was the condition in March, 1921, and no time was lost in applying the necessary correctives. The boilers were thoroughly cleaned and carefully inspected and have since been kept in the best condition that intelligent care and oversight can produce. Old recording instruments were brushed up and new ones were secured, the stack temperature carefully and regularly noted, drafts regulated, steam flow meters cleaned up and reconnected, and careful and regular records kept in connection with the turbine and condenser, as well as in the boiler room.

Investigation Produces Results

The results of this thorough housecleaning are that the entire load which formerly required three boilers is now carried very comfortably on one. The fuel cost has shown a steady decrease. For the first five months of 1921, from January to May, inclusive, the average cost was 2.36 cents per kilowatt hour. Since the time that the improvements were completed, the fuel cost has shown an even more gratifying decrease, dropping from 2.36 cents to an average of 1.05 cents per kilowatt hour, a saving of 1.31 cents per kilowatt, or a net saving of $9,417.63 for the three months, and approximately $28,000 for the year. The fuel cost of 0.92 cents in September, 1921, was the lowest recorded, and since then it has remained somewhere between 0.9 and 1 cent per kilowatt hour all the time. The following table is a comparison of the cost of production before and since the completion of new equipment:

	Fuel Cost	Output Kw. Hrs.	Cost per Kw. Hr.
January, 1921	$3,825.80	152,953	.025
February	2,784.00	136,594	.024
March	3,984.00	152,975	.026
April	3,708.00	145,316	.025
May	3,478.00	155,004	.022
June	2,210.27	161,564	.013
July	1,739.99	167,561	.010
August	1,826.02	195,195	.0093
September	1,792.72	194,583	.0092

NET SAVING IN FUEL ALONE

	Fuel	Output	Cost per Kw. Hr.
1921—1st five months	$17,279.80	741,942	.0236
1921—Next 4 months	7,569.00	718,903	.0105
			.0131

Net saving per kw. hr. on fuel	$ .0131
Net total for four months on fuel	9,417.63
Representing for one year total fuel saving	28,252.88

The plant is now using a recording flue gas meter, a recording steam gage, a recording and integrating steam flow meter, a feed-water temperature meter, and a stack temperature thermometer. Switchboard records are also kept, showing all the readings of the load, output, steam pressure, vacuum and voltage.

Further tests and records are being made, showing labor cost, maintenance and distribution. When these are completed, we shall be able to show in detail where we stand and what we are accomplishing for any given day, month or year. These tests are made simply for our own information and for guidance in the operation of the plant. This should be the aim of every municipal power-plant, as improvements which are properly conducted and checked are bound to show decreased operating costs and decreased depreciation. The saving in operating expense has shown a very gratifying improvement in net receipts and is being used for rebuilding the transmission rods. It is planned to install a new white way at an approximate cost of $20,000 to $25,000. This cost will be shared between the business men and the electric light plant, probably on a 50-50 basis.

New York Plans a Gigantic "Don't Get Hurt" Campaign

BELIEVING that Safety Weeks, desirable as they are, need constructive follow-up, the New York Public Safety Committee, of which Judge Elbert H. Gary is Chairman, has just announced plans for a great safety campaign starting with a Safety Week in October and followed by a continuous program for the succeeding twelve months. The slogan of the campaign will not be "Safety First" or "Be Careful," but the more specific warning, "Don't Get Hurt." According to L. V. Coleman, Director of the Safety Institute, Safety Weeks serve three purposes: first, they have demonstrated that safety is practicable by actually lowering the death rate for seven days—a well-managed week never fails to accomplish this result; second, such a week enlists the support of leaders in the community upon whose continued help lasting accident reduction must depend; third, a Safety Week gives publicity to the mechanism of the permanent program, and assures for it the serious attention which it deserves and must have in order to be successful.

The continuous program, of which the first week is but a start, is a complete innovation. Programs covering a shorter period have been demonstrated in other cities, but the year-round program especially adapted to New York is a result of careful studies which the Safety Institute has conducted during the past twelve months.

First in importance in teaching safety is the work in the public and parochial schools. One-half of all that has been done to promote safety has been done through school agencies, for not only is it possible to teach children to escape accidents, but it is known that the adult population gives more heed to messages brought home by the children than it does to those received through other channels. The New York program has already received the official endorsement of Dr. Ettinger, Superintendent of Schools.

The second feature is the school for automobile drivers to be conducted in separate classes in each of the five boroughs. The course, covering three months and repeated at short intervals, aims to instruct drivers in the careful operation of motor cars and to develop in them sympathy for the efforts of the police to control traffic.

Schools for foremen, who have shown themselves to be men who can control industrial accidents, will also be instituted. An Accident Statistics Bureau, to be established as a department of the Safety Institute, will assemble and interpret the facts.

Official approval has been given to the project, and the city officials whose departments come in contact with the work will assist in directing the program into the most effective channels. The press is already giving hearty cooperation.

From the Mayor of St. Peter, Minn.

To the Editor of The American City Magazine:

May I call your attention to an article which appeared in the June issue of your magazine entitled "What Are Women Mayors Doing?" in which you have made an error and which in my candidacy for Congress is working to my detriment.

You say, "Mrs. A. K. Gault of St. Peter was appointed by the City Council, all of whom were men, after the elected mayor refused to qualify."

Nothing could be farther from the truth!

The material for this write-up was given you through the courtesy of *The Woman Citizen* and just where the mistake crept in, I do not know.

As a matter of fact, I was waited upon some three months before the city election by men representing various business interests of the city and asked to become a candidate; after taking two weeks to consider the matter I consented.

My opponent was a former schoolmate, a resident of my ward, and had served the city acceptably as mayor some years ago. The contest was close, but I won.

I am sure a magazine of your standing will be only too glad to present the facts in the case.

I enclose a clipping from one of the papers in my district and copied into the home paper.

July 15, 1922.

LILLIAN COX GAULT
(Mrs. A. K. Gault)

You Can Say "Danger" Too Often

Danger Signs Should Be Used Only Where Danger Actually Exists

By A. R. Hirst

State Highway Engineer, Madison, Wis.

MUCH can be done to promote safety in the use of highways by the erection of proper signs at places which are really dangerous. All railroad crossings should, of course, be posted. Many states have uniform signs and uniform posting laws. The white circular disc with the two black division lines and the letters "R. R." is now practically standard. Inasmuch as its use is so general, it should be made universal. All sharp turns should be marked with signs, also schoolhouses, approaches to principal highway crossings, and all other places where the operator of a car should have it under full control. Dead ends and very sharp turns which are unavoidably present should be boarded across the ends with a white sign-board, with an arrow indicating the direction of the turn.

During road construction, green flags should be used by day and green lights by night to give warning of danger ahead. The actual point of danger should be red-flagged and red-lighted at the point of repair or replacement. A single red light at the point of replacement or repair is not sufficient on high-speed roads, because often these lights are mistaken for the rear lights of motor vehicles, and even when they are understood, the driver sometimes cannot stop before striking the obstruction. There has been too little use of caution signs well in advance of danger, and practise in this respect should be improved. In erecting signs indicating danger, care should be exercised that they are not erected where, in fact, no danger exists, because the constant passing of danger signs if no danger is later apparent makes the driver careless and has the effect of the cry of "Wolf, wolf!" and finally, when actual danger is encountered, disaster is likely to ensue.

Incident to the use of proper guiding and warning signs is the very advisable removal of all advertising signs along highways, especially those which interfere with vision. I belong to the cult which believes that our highways are no place for advertising. There are enough avenues of publicity open to those who wish to sell their goods without making our rural landscapes a futuristic nightmare. The total elimination of such signs is coming very fast, and this reform will probably do more to add beauty to our highways than any other single thing. If manufacturers understood that instead of adding to their trade, these signs undoubtedly serve to lessen it, the passing of the signs would be only a matter of a very few years—and they can be made to understand this by a proper campaign of education and warning.

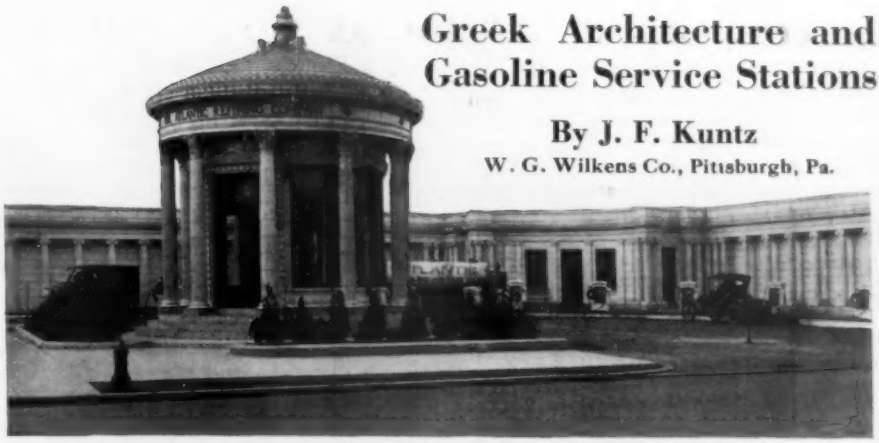
The division of roads and center marking, especially at curves, is a growing practise. Against this can be urged the objection that it serves to concentrate traffic too much and that it also keeps traffic constantly near the edge of the road slabs, thus increasing corner breaking. I feel that its expediency is very debatable on straight stretches of highway, but that on curves it should be universally used. The possibility of indicating turns, road intersections and approaching danger on the road surface itself has not been thoroughly worked out, but there are decided opportunities for advance along these lines. The good driver is always watching the road and can readily note such signs if they can be kept clearly marked.

1921 National Fire Loss $485,000,000

J. B. Morton, President of the National Board of Fire Underwriters, stated at the recent annual meeting of the Board, that although there was no single conflagration of any magnitude in 1921, the fire losses for that year in the United States probably would approximate $485,000,000. The Committee on Incendiarism and Arson reported that in the last fiscal year it investigated 832 fires, in connection with which 368 arrests have been made, 210 cases have been tried, with 159 convictions and 51 acquittals.

Greek Architecture and Gasoline Service Stations

By J. F. Kuntz
W. G. Wilkens Co., Pittsburgh, Pa.



A MODEL GASOLINE FILLING STATION OF THE ATLANTIC REFINING COMPANY IN PHILADELPHIA

A CASUAL survey of any of our large cities or small towns leads to the conclusion that many buildings of more or less prominence have apparently been designed by the hapless victims of some especially conspicuous form of mental aberration. The fact that this unfortunate condition is generally due to the short-sighted policy of the owner rather than to any misconception of true artistic values on the part of the architect, naturally points the way to a solution of the difficulty. Public-spirited citizens, working through civic clubs and city planning commissions, can arouse a spirit of cooperation and make an appeal to local pride that will result in a better conception of individual responsibility by each and every property holder.

The situation is unquestionably improving, from the architectural standpoint, and this statement is especially applicable to the various structures now being erected in connection with the automobile traffic. In an infant industry that grew to gigantic proportions almost over night, certain makeshift arrangements were inevitable in preparing to cater to a constantly expanding volume of trade. In consequence, our automobile highways have been dotted by nondescript buildings which offended the eye of the beholder, and possessed but one solitary attribute as a justification for their existence—utility. Like the bill-boards, these structures threatened to become a permanent blot upon the landscape.

Realizing the objections to such an unsightly growth, and desiring to forestall the criticisms which were bound to follow, The Atlantic Refining Company, of Pennsylvania, decided to make a radical departure from established precedent and erect a series of ornamental service stations that would minister to the needs of its customers and at the same time serve as an advertising medium for its product, combining the function of service and the quality of beauty in approximately equal proportions.

Situated at various points in the cities and villages and along the principal highways of Pennsylvania and New England, these beautiful little edifices delight the eye as well as they serve the public. The stations have all been designed by, and erected under the supervision of, The W. G. Wilkins Company, architects, of Pittsburgh, Pa. Constructed of terra cotta, in white or colors, in combination with tile and terra cotta roofs and ornamental plaster in harmonizing shades, they afford a wide variety of types and sizes, with special designs to suit individual locations and space requirements.

It is the consensus of opinion that the best of them is the station located at the intersection of 40th and Walnut Streets, Philadelphia. This dainty little edifice graces one of the most popular automobile roadways in the Quaker City, and daily caters to the wants of an ever-increasing throng of motorists. It is a reproduction, on an enlarged scale, of the monument to Lysicrates, still standing in Athens, and is

surrounded on two sides by an Ionic colonnade, the details of which are taken from the Erechtheum, another classical survival located on the site where Pallas Athene waged war with Poseidon for the possession of her beloved city.

The building is constructed of dazzling white terra cotta, and its perfect proportions will linger long in the memory. This charming reproduction of one of the finest bits of Grecian architecture extant forms a striking contrast to the great majority of buildings erected for the purpose of supplying the wants of modern charioteers.

Cooperation in erecting buildings that are both practical and beautiful is the only effectual method of preventing architectural monstrosities and securing a proper appreciation of the necessity of applying esthetic interest to natural human needs in the building up of cities and towns. It is practical city beautification.

Lawn-Mowing Cost Affected by Species of Ornamental Trees

By L. S. Dickinson

Superintendent of Grounds, Massachusetts Agricultural College

LAWN-MOWING cost is influenced by many factors, some of which are easily overlooked. For example, hardly anyone would think that a difference in the kind of trees in the lawn would affect the pay-roll, yet even this small item may make a substantial increase or decrease in final cost.

It is obvious that trees are a hindrance to lawn mowing. Time is required to turn out for them and to hand-trim about them. It is also obvious, when considered, that the species of those trees makes a considerable difference in the cost of trimming the grass beneath them, and in making comparisons of lawn-mowing costs it is a factor to be considered.

Maples and elms are the cheapest to trim under. The large machines can get very close to the trunks, leaving only a small triangular area on two sides of the tree to trim by hand machine. Few branches and twigs are found beneath these trees, and in the fall they are denuded of their leaves rather late, and generally within one week, all of which makes the trimming easier and less expensive.

Evergreens are probably the most expensive to trim about, especially if their branches are resting upon or near the ground, and the larger the diameter of their spread, the greater the cost. If the branches are one foot from the ground, the amount of hand trimming is not as great as if on the ground. The large machines can, if care is used, work under these branches and reduce the hand trimming to the minimum. In either case, however, the evergreen presents a serious obstacle to the large machine. Much time and duplication of cutting is necessary before the machine can straighten out on a clear course again.

Lindens, if their branches hang low enough to the ground, present the same problem as the evergreen, with perhaps some hand trimming inside the leaf-spread. If their branches are trimmed high enough to permit free passage beneath, it will be necessary to spend time picking up twigs. There is hardly a time of the year when they are tidy, and they are especially annoying when fruiting.

Oaks, while not as bothersome as lindens, present a serious annoyance after the acorns begin to fall. The machine must either be set to cut higher than usual or the acorns must be raked before each mowing.

Horse-chestnuts present first the blossom stems, tough and very numerous, then the green burs, followed by the nut with the shucks, and——but no more need be said to demonstrate our proposition, that the kind of tree vitally affects the cost of mowing. Just keep a few records yourself and note the results.

Combating Odor Nuisance at Garbage Disposal Plants

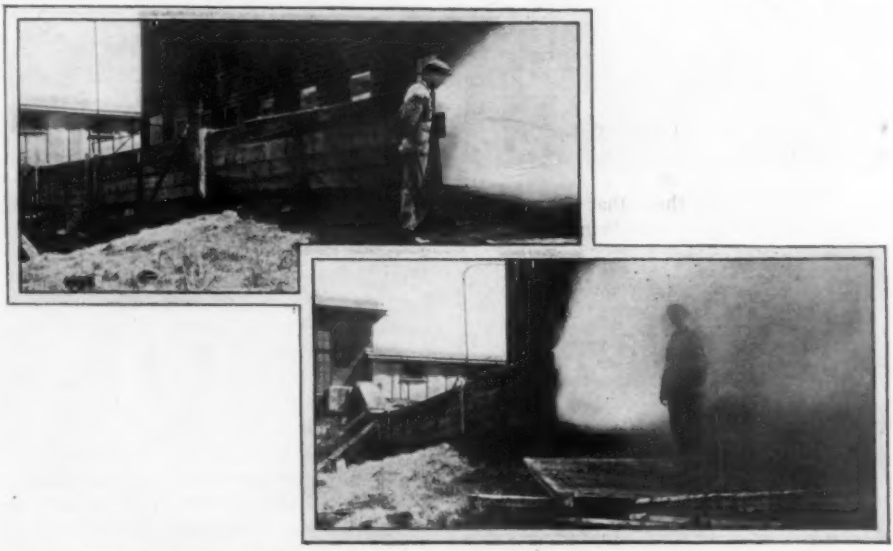
Objectionable Odors Made Innocuous with Minute Quantities of Chlorine Gas

By W. J. Springborn
Consulting Sanitarian, New York City

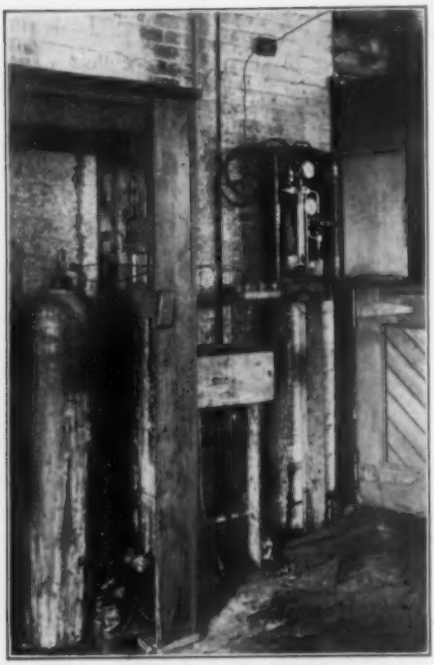
THE average American city, as compared to Oriental cities, is quite free from obnoxious odors. Those odors which do exist present a difficult problem to the city official, because usually the source of objectionable odors is a necessary function in a community, the cessation of which would actually prove far more harmful than the odors themselves.

Certain methods for the disposal of municipal waste, such as garbage and sewage, are nearly always accompanied by odors which annoy many people living near the plant. Occasionally plants of this kind have been abandoned with large monetary loss and not infrequently with a relapse to makeshift disposal methods. Rendering plants are the cause of considerable odor nuisance in the districts adjacent to them and also cause considerable reduction in real estate values. The courts have generally held that such plants are necessary and that the smell they produce is not a sufficient reason for closing them down.

Through the work of Professor Yandell Henderson, of Yale University, and his associate, Dr. H. W. Haggard, as consultants for the Bureau of Mines, the value of chlorine gas as a deodorizing agent has come to be more clearly appreciated. The sterilizing value of chlorine gas in municipal water-supplies is well known. In an investigation of the antiseptic value of small quantities of chlorine gas in air, it was discovered that the gas displayed a strong antipathy to any odor in the air, destroying it quickly. Probably a chemical reaction takes place which unites the odor



THE EFFECT OF THE APPLICATION OF CHLORINE TO GARBAGE DRIER ODORS
Above—Odor unbearable before introduction of chlorine. Below—Odor entirely eliminated by chlorine



THE CHLORINE CONTROL UNIT AT NEW BEDFORD

and the chlorine to form an odorless compound. It is possible for either the odor or the chlorine to predominate and finally persist to the elimination of the other, but both can not be maintained in the same atmosphere for more than six or seven seconds, and when the two are exactly balanced both disappear so completely that they can not be detected.

A Practical Test at New Bedford

Opportunity to test the value of this discovery came when the municipal garbage disposal plant at New Bedford, Mass., for which the writer was acting in a consulting capacity, began burning garbage tankage under its boilers as a means of reducing expense. This produced a disagreeable odor, which was complained of by people in the neighborhood. When preliminary tests in other places indicated the value of Professor Henderson's discovery, a direct-heat dryer was installed for the purpose of extracting most of the moisture from the garbage before placing it in the Cobwell digesters. This direct-fire garbage dryer, which handles an average of 40 tons per day, measures 40 feet long by 5 feet 6 inches diameter. The dryer has been in continuous daily operation since last November. The material entering the dryer contains approximately 70 per cent moisture and is discharged with a moisture content of between 15 and 20 per cent. The odor-bearing vapors are drawn from this dryer by means of an exhauster or fan (which creates a forced draft for the fire) through a water spray or curtain and are discharged into a wooden duct 3 feet square and 70 feet long, placed horizontally on ground level, as shown in the accompanying illustrations.

Chlorine is fed into this duct at the point of discharge of the vapors from the exhauster in proportion to the amount of vapors being produced. The chemical control apparatus, known as the "Henderson-Haggard Deodorizing Equipment," regulates the flow of chlorine per hour. This apparatus, after being set at the desired rate of flow, requires practically no attention except to open and close the valves on the chlorine tanks when starting and stopping drying. This apparatus converts liquid chlorine into a gas which readily reacts on the vapors.

The amount of chlorine required to entirely eliminate the odors is very small. A total of 4,098 tons of material was handled between November and May, and the chlorine used on this tonnage amounted to 900 pounds, costing 7 cents per pound. In May 842 tons of garbage was handled and 299 pounds of chlorine was consumed, the chlorine now costing 5½ cents a pound. After the chlorine treatment, the vapors discharged from the duct are allowed to escape into the atmosphere, and at no time have objectionable odors been detected from the dryer, neither have any complaints been made since the installation of the equipment.

After leaving the dryer, the garbage is degreased by the Cobwell process and finished off for fertilizer purposes. The grease and tankage recoveries since the installation of the dryer are equal in every respect to the former products. The free fatty acid content of the grease averages 15 per cent, and the unsaponifiable matter about 1.75 per cent. According to C. M. Schindler, Superintendent of Garbage Disposal, New Bedford, Mass., the deodoriz-

ing process has been so satisfactory in exceeding the guarantees originally made, that there is no question of its permanency in New Bedford.

Another advantage, based on the known fact that preliminary drying would reduce the time of cooking of garbage in the digester, is that the expense of all the digestive processes has been reduced. The period of digestion has been reduced from 12 hours to about 3 hours.

An interesting test of the deodorizing process under the most severe conditions at New Bedford has been made by placing a quantity of putrid material, hair, feathers, leather scraps, and rags in the dryer, thus producing an odor so powerful as to be unbearable. The odor has invariably been promptly and effectively eliminated by the simple turn of the chlorine cylinder valve cocks.

Other similar installations have demonstrated the value of the system to packers, fertilizer and tankerage manufacturers, soap makers, and manufacturers engaged in similar enterprises. The method of installation is quite as simple as the process itself; it is only necessary to collect all of the odors in one duct or mixing chamber and then apply chlorine at a point where it will mix readily. Water vapor seems to be a necessary constituent of the air to be treated, and if this is not present it must be supplied. All dust must be removed. The water spray which supplies vapor to the gases also takes out all dust, the removal of which is essential to the success of the deodorization process. The size and nature of the chlorine control apparatus must be gaged so that the flow of chlorine will exactly balance the odors to be treated. All these factors must be carefully determined in advance by trained technicians, but once the installation is complete, it operates almost automatically with little further attention or labor. A special type of chlorine control valve, which keeps the flow constant regardless of temperature conditions or tank pressure, makes this possible.

Two Kinds of Firemen

THE medals awarded annually to members of the Fire Department of New York City mean little, as compared with the work of the department as a whole. Eleven awards for rescue or "heroic work at extreme personal risk" recompense but nine rescues out of uncounted lives saved. Other medals for company discipline and efficiency represent but a fraction of the smoothly running service that keeps down disaster by fire in all parts of the city.

The eye singles out these twenty-seven medal men and sees in them the sum total of service, superhuman bravery and devotion. But in the department itself these qualities are all in the day's work. And the day's work does not always mean making spectacular rescues.

It is unfortunate that some public-spirited citizen cannot donate a medal to be awarded annually to those firemen who prevent fires, who have organized and kept working a system that reduces fire hazard to a minimum. Though this aspect of the job is not spectacular, it is a source of fully as much pride as the other. Let us not forget it in acknowledging our appreciation of the fireman. —*New York Sun.*

The Attention Given to the Health of School Children

TWENTY, ten and even five years ago, the children in the elementary schools were given only casual attention from the health standpoint. There was little medical inspection and there were no gymnastics. Children took occasional breathing exercises, standing up in the aisles of the rooms. Children were supposed to be healthy.

This complaisant attitude existed until the war. The revelations of the examining boards in respect to the great number of physically unfit opened the eyes of the layman to a serious situation. If this was a serious situation in war time, it is equally serious in peace. Sickness means loss of time, and loss of time means loss of money. Wages stop and doctors' charges must be met. A number of people statistically inclined reckoned this loss of time in terms of money, and the amounts were so great that the imagination was staggered.

School authorities should seriously consider the question of health examination in schools and proper physical exercise to help the young mind to develop properly.

—*The Detroit Educational Bulletin.*

Summary of Street Lighting Statistics of Pennsylvania Cities of the Third Class---1921

Material Gathered by Pennsylvania Department of Internal Affairs, State Bureau of Municipalities

City	Population	Owned	No.	Kinds of Lighting	Cost Per Year	Lighting Appropriation	Per Capita Cost
Reading	108,955	Privately Electricity Gas	915	Arc	$65.00	$88,000	.88
			716	Tungsten Incandescent	18.12		
			582	Welsbach Gas Lamps	23.00		
Erie	102,000	Privately Electricity	1350	Magnetite Arc	52.93	85,964	.84
			87	100 Watt Incandescent	25.55		
			37	Ornamental Magnetite Arc	65.70		
			76	Ornamental Magnetite Arc	62.05		
			15	250 Watt	40.15		
			40	60 Watt	14.60		
Allentown	79,678	Privately Electricity	352	Arcs	64.00	50,465	.63
			639	100 C. P.	19.25		
			12	Spotlight	64.00		
			146	250 C. P..	40.00		
			172	600 C. P. Boulevard Lights 86 lighted half night $40 for half night	64.00		
Harrisburg	77,876	Privately Electricity	726	Arc	58.95	66,349	.85
			96	100 C. P. Incandescent	24.00		
			26	32 C. P. Incandescent	20.00		
			85	5 Lt. Clusters	85.00		
			52	Standards	98.60		
			78	100 C. P. Incandescent Series	22.00		
			30	100 C. P. Incandescent Series	20.00		
			209	Standards in Parks	24.00		
			15	600 Watt	58.95		
			30	100 Watt	24.00		
			4	3-Lt. Clusters	54.00		
			2	200 Watt Subway	39.00		
			11	100 Watt	20.00		
Wilkes-Barre	74,576	Privately Electricity Gas Naptha	685	Novalux Arc	50.00	54,147	.73
			327	Gas	28.00		
			150	Naptha	29.00		
			30	1-Lt. Standards	33.00		
			105	5-Lt. Standards	50.00		
Johnstown	68,000	Privately Electricity	594	Arcs	50.00	41,000	.60
			111	250 C. P.	39.00		
			12	100 C. P.	26.00		
			157	Incandescent	25.00		
			5	Special	39.00		
Altoona	62,134	Privately Electricity	336	Metallic Flame Arcs	64.50	38,500	.62
			9	100 C. P. Series—Incandescent	21.00		
			81	400 C. P. Boulevard Standards	36.50		
			209	400 C. P. Novalux Fixture	30.50		
			16	Bridge Lights on meter			
Chester	58,610	Privately Electricity	444	Arc	65.00	35,000	.60
			514	40 C. P. Incandescents	14.25		
			96	100 C. P. Incandescents	24.00		
Bethlehem	54,689	Privately Electricity	238	300 Watt Mag.	66.00	47,000	.86
			431	40 Watt Incandescent	16.00		
			193	400 C. P. Incandescent	46.00		
			166	400 C. P. Incandescent (Midnight)	31.00		
			30	40 Watt Incandescent Ornamental	16.00		
Lancaster	53,681	Privately Electricity Gas	670	Arc	66.00	62,000	1.15
			414	Welsbach type 50 C. P.	34.00		
			15	Naptha	48.00		
York	47,788	Privately Electricity	497	Arc	55.00	37,505	.78
			92	Arc (Half Night)	45.00		
			141	Tungsten Lamps	30.00		
			12	5-Lt. Clusters	70.00		
			77	Fire Alarm Box Lights	7.00		
McKeesport	47,249	Privately Electricity	157	400 C. P. Incandescent	55.00	39,000	.82
			688	250 Watt Lamps	40.00		
New Castle	45,387	Privately Electricity	400	Arc	48.00	25,000	.55
			147	Incandescent	23.00		
Williamsport	36,560	Privately Electricity Gas		Arc Lights	42.00	23,000	.63
				Gas Lights	25.00		
				Incandescents	18.00 24.00		

City	Population	Owned	No.	Kinds of Lighting	Cost Per Year	Lighting Appropriation	Per Capita Cost
Easton	34,151	City owns plant, poles, wire, etc. Buys current on meter. Electricity	222	Bracket Luxolite (60-80-100 C.P.)			
			342	400 C. P.	.03	34,650	1.01
			117	Post 600 C. P.	kilowatt		
				Park lights not in			
Hazleton	32,595	Privately Electricity	240	Arc	60.00	20,000	.61
			28	80 C. P. Mazdas	25.00		
			14	400 C. P. Mazdas	40.00		
			14	400 C. P. Mazdas	60.00		
			19	600 C. P.	45.00		
			19	600 C. P.	65.00		
			20	250 Watt	42.00		
			8	250 Watt	42.00		
			29	100 C. P.	17.00		
Lebanon	24,889	Privately Electricity Gas	189	Arc	$66.00	$20,000	$ .80
			235	Incandescent	15.00		
			1	Signal Light	12.00		
Butler	24,016	Privately Electricity	60	5-Lt. Standards (1 250 C. P.—4 80 C. P.)	28,552.35	29,500	1.22
			126	3-Lt. Standards (1 200 C. P.—2 80 C. P.)			
			391	80 C. P. Incandescent			
			291	250 C. P. Incandescent			
				ADDITIONAL LIGHTING			
				5-Lt. Clusters	50.00		
				3-Lt. Clusters	45.00		
				250 C. P. Incandescent	34.00		
				80 C. P. Incandescent	21.25		
Sharon	21,964	Privately Electricity	150	Arc	48.00	14,312	.65
			350	Incandescent—100 W.	15.55		
Pottsville	21,940	Privately Electricity	245	Arcs	55.00	22,800	1.04
			94	Incandescent	23.00		
			54	Lum. Arcs	92.50		
			1	Arc & 3 Incandescent part time	13.02		
				Extra lights not listed	32.92		
Oil City	21,487	Privately Electricity	178	400 Arc	56.00		
			220	100 C. P. Incandescent	21.60	10,000	.54
Duquesne	19,200	Privately Electricity	219	250 C. P. Tungsten	40.00		
			10	100 C. P. Tungsten	25.00		
			6	Poles	60.00		
Carbondale	18,826	Privately Electricity	11	100 Watt Lamps	26.00	8,900	.47
			234	60 C. P. Incandescent	18.00		
			57	600 Watt Lamps	55.00		
Pittston	18,682	Privately Electricity	156	Arc	50.00		
			174	Incandescent	15.00	10,000	.54
Uniontown	15,765	Privately Electricity	14	600 C. P. Lamps	65.00	16,000	1.01
			141	400 C. P. Lamps	55.00		
			84	250 C. P. Lamps	40.00		
			180	100 C. P. Lamps	30.00		
Bradford	15,680	Privately Electricity	187	6-Ampere Arcs	55.00	16,690	1.06
			38	Ornamental	50.00		
			38	Half night	25.00		
			4	100 C. P. Incandescent (alley light)	24.00		
			6	400 C. P. Incandescent (park light)	25.00		
Meadville	14,714	City Electricity	200	4-Ampere Luminous Arc		11,520	.78
			35	60 Watt Incandescent			
Coatesville	14,660	Privately Electricity	134	Arc		12,000	.82
				1st-100	62.50		
				Next 25	60.00		
				Next 25	57.50		
			123	Incandescent	18.00		
Connellsville	13,900	Privately Electricity	2	400 C. P. Incandescent	55.00	12,000	.86
			82	250 C. P. Incandescent	40.00		
			264	80 C. P. Tungsten Nitro.	25.00		
			21	600 C. P. Tungsten Nitro.	70.00		
DuBois	13,818	Privately Electricity	156	Arc	55.00	9,500	.69
			3	Boulevard Lamps	90.80		
Franklin	10,070	Privately Electricity	143	Arc	60.00	10,500	1.04
			51	600 C. P. Incandescent	21.00		
			10	5-Lt. Post Cluster	42.00		
			10	1-Lt. Post Cluster	21.00		
			2	1-Lt. Post Cluster	42.00		
Monongahela	8,775	Privately Electricity	8	400 C. P. Incandescent	55.00	6,800	.78
			38	250 C. P. Incandescent	40.00		
			186	80 C. P. Incandescent	25.00		
Lock Haven	8,643	Privately Electricity	111	600 Watt	60.00		
			61	7½ Ampere	15.30		
			79	60 Watt	25.00		
Titusville	8,516	City Electricity	13	600 C. P. Series Lamps		6,000	.70
			160	400 C. P. Series Lamps			
			37	250 C. P. Series Lamps			
Corry	7,300	Privately Electricity	23	Arcs	52.50	5,600	.77
			26	100 C. P. Incandescent	17.00		
			268	60 C. P. Incandescent	15.00		

Binghamton's Budget Study Wins Public Interest

By W. Earl Weller
City Engineer, Binghamton, N. Y.

MAYOR THOMAS A. WILSON has recently completed a comprehensive and rather unique investigation of the expenditures of the various municipal departments in Binghamton, N. Y. Under the Mayor's direction, the annual budgets of the city for the past fifteen years were analyzed, on the general assumption that the municipality is a large public service corporation furnishing certain services to the people at cost. In making the analysis, the taxpayers' question, "What do we get for our money?" was borne constantly in mind. The various municipal services were arranged under four general headings: Governmental, Public Works, Public Safety, and Public Instruction. These four main headings were subdivided into separate services, as shown in the table opposite. Expenditures for such purposes as the assessing and the collecting of taxes, auditing and paying city bills, and conducting the affairs of the municipal civil service, were classified as general overhead items and prorated to the various services shown in the table. These expenditures might have been separately classified under the general heading of Governmental Services, but it was deemed better to restrict that classification to the true governmental functions.

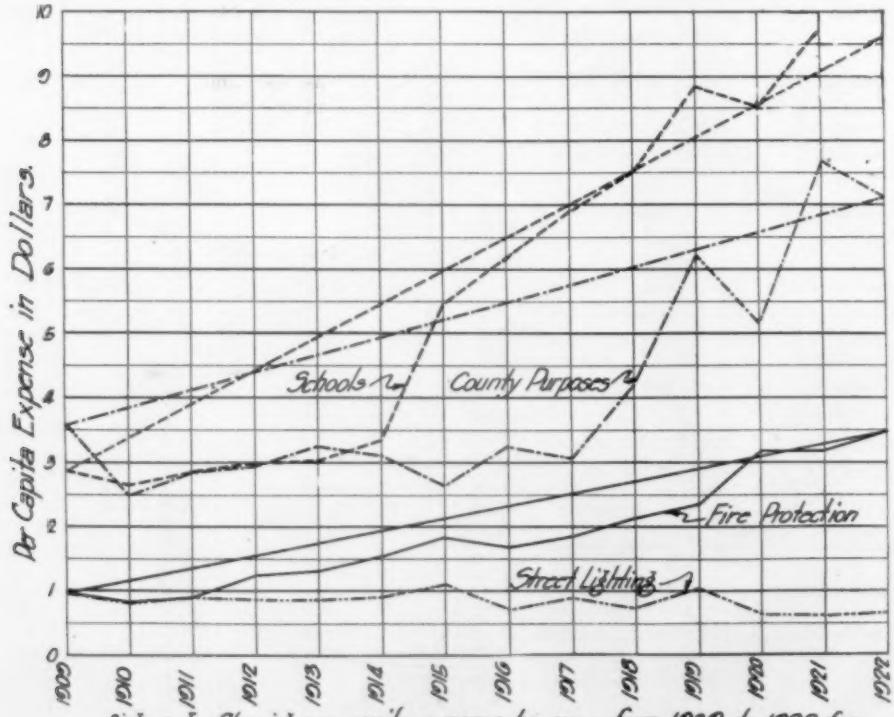


Diagram I.—Showing per capita expense by years, from 1909 to 1922 for Schools, Fire Protection, County Purposes, & Street Lighting in Binghamton N.Y.

CLASSIFICATION ADOPTED FOR BUDGET ANALYSIS

- Governmental Services
  - Executive
  - Common Council
  - City Clerk
  - Elections
  - Judicial
  - State and County Tax
- Public Works Services
  - Water-Supply
  - Sewers
  - Streets
    - Pavements
    - Roads
    - Bridges
    - Walk and Curb
    - Miscellaneous
  - Rivers and Creeks
  - Garbage Collection
  - Street Lighting
  - Public Baths
  - Parks
  - Comfort Stations
- Public Safety Services
  - Police Protection
  - Fire Protection
  - Health
    - Hospital
    - Miscellaneous
  - Miscellaneous Protection
  - Charity
- Public Instruction Services
  - Schools
  - Library

The amount chargeable to the various services was determined in each case by adding to the budget appropriations for the operation and maintenance of that service all items of bond redemption and bond interest chargeable to the service under consideration. This was called the actual expense. To this figure was added the prorated share of the general overhead expense, and the result was called the gross expense. Any revenue received from the service and the prorated share of the general revenue of the city were then deducted, the remainder, called the net expense of the service, being taken as the charge against the taxpayers for whatever benefits they might derive from that service. In order to allow for the growth of the city and to reduce the figures to a comparable basis, all net expense figures were divided by a figure representing the population of the city for the year. The result was, in each case, the amount spent per person during the year for the individual service or, in other words, the per capita cost. These per capita costs were plotted in diagrammatic form for study. Any diagram showing a tendency toward increasing per capita cost was taken to indicate the need for a detailed study of the municipal service represented by that diagram.

Recognizing that an increasing per capita cost curve might indicate that needed extensions of that service had been made during the period investigated and might, therefore, be entirely justified, Mayor Wilson caused the 1921 budgets of the cities of Albany, Schenectady, Syracuse, Troy, Utica and Yonkers—the other second-class cities in New York State—to be analyzed along similar lines. Whenever the per capita cost of a service in Binghamton was shown to be far from the average per capita cost of the same service in the other cities, that service in Binghamton was carefully investigated. The results were of considerable practical value, and some specific examples are especially interesting.

The figures for street cleaning show that in 1921 Binghamton spent $0.455 per person, while the other cities spent amounts ranging from $1.183 to $1.438. Dividing the gross expense for street cleaning by the mileage of paved streets showed that Binghamton was spending $1081.50 per mile against a minimum of 1069.60 and a maximum of $1872.20 in the other cities. This difference was not so startling, and since the streets in Binghamton were being maintained in a satisfactory condition on the score of cleanliness, it was clearly not necessary to carry the investigation any further.

The figures for street lighting did not lead to so satisfactory a conclusion. These figures showed Binghamton to be spending $0.678 per person for street lighting, while the other cities were spending from $0.863 to $1.745 for the same service. Supplemental figures showed Binghamton to be proportionately as far behind the other cities on the point of candle-power furnished per mile of street as it was on the amount expended per person for the service. This indicated that Binghamton was not in step with the other cities in the matter of street lighting and, as a consequence, 1922 will see the inauguration of an extensive series of improvements to the street lighting system.

These examples indicate the practical use that was made of the charts and tables. Members of the city administration are satisfied that, as a method of self-examina-

tion or as an indication of departments in the municipal government needing especial attention, the method has great possibilities. At the time the investigation was started it was expected that the result would show rather serious extravagances in some of the departments. In this respect the investigation has been a gratifying failure. It has, however, indicated the need for the abandonment or the change of certain procedure, especially in connection with the construction of street improvements, if the city hopes to keep pace with the other cities of its class. It has also indicated that the increase in the gross budget of the city during the period in question is not the inexplicable mystery it was credited with being.

The figures are serving yet another purpose in allaying a well-defined and very prevalent opinion on the part of the general public that more money was being spent for municipal purposes than the needs justified. Incidentally, the consideration of the figures brings to the public mind the realization that municipal services are very similar to other public services and that increased demands bring very naturally in their wake increased charges. If the charts and tables had no other value than this last educational one, they would be well worth the time and effort spent upon them.

Compare Civil Service with the Spoils System, Not with Ideal Private Employment

To the Editor of the American City:

I have been interested in the discussion you are carrying in your columns as to whether civil service rules tend to promote efficiency, and note that you invite expression of opinion on the subject. Our experience and study of the question indicate that although civil service has many defects when analyzed in comparison with ideal civic employment conditions, it has operated with great success in improving the efficiency of the public service, especially when it is compared with operation under the "spoils system" which it replaced.

To my mind, the contrast should be between civil service as it operates and public service under the spoils system, rather than that the contrast should be with ideal conditions in private employment; for the reason that if we scrap civil service, we shall not advance to the ideal conditions obtaining in private employment, but shall step backward to the inefficient and political conditions which grow out of a spoils system.

The principal criticism of civil service as it commonly operates is that, designed originally to prevent the wholesale political turnover in public empoyment, it has swung too far toward guaranteeing life employment in the city service regardless of merit. The discipline that is effective in the average municipal employment is not so much the result of civil service rules as it is the result of the political system which still permeates municipal service to a varying degree throughout our various cities.

While I have observed comments of certain city managers to the effect that civil service has hampered them, it has been my opinion in analyzing their comments that what they desire is an improvement of civil service procedure and not its abolishment. Were civil service to be abolished in a city governed by a manager, and all appointments made subject to his sole control, he would find that the strong and continuous pressure relative to individuals in the service, or desiring to get into the service, would grow to a point where he would probably have little time for the transaction of the more important details of city business for which the municipality engages him.

Civil service commissions can help city administrators by pointing out wherein civil service powers are defective, and seeking to improve the laws so that the municipal service can be modeled more along the lines of personnel service in the larger corporations. To my mind, civil service must evolve in the future along the lines already established by large private corporations, wherein it will function as an expert, scientific, employment-classifying, salary-finding agency, with power reserved to the various executives to dismiss for cause, subject to review (but not control) by the civil service agency.

W. H. NANRY,
Director, San Francisco Bureau of Governmental Research.

May 25, 1922.

Forward Steps in Municipal Affairs

Police Departments

A Model Record Department

ST. LOUIS, MO.—The Police Department of St. Louis is accredited with having one of the most efficient record departments of any police organization in America. The system appeals to the busy police officer, who best can appreciate expediency in the matter of record and identification, and its card index system is second to none.

The inception of the record department probably was coincident with the establishment of the Police Department. Early attempts at such a system, utilizing large filing cases, although valuable, proved highly unsatisfactory, because of the constant enlargement of the force and the increasing prevalence of crime. In 1906, when the record department had become recognized as a positive factor in the organization, loose-leaf indexes were installed. These, also, subsequently proved inadequate, because of the increased volume of the matter handled and the complexity of the system.

In 1912 the need of a comprehensive system was so pronounced as to cause a complete reorganization of this department and the installation of a card index system. This system, on account of its elasticity and ready adaptability to change, is in use to-day and is capable of instant response to

ST. LOUIS POLICE DEPARTMENT'S MODEL RECORD ROOM

the demands of nearly two thousand police officers, detectives, and policewomen.

This department now contains well over 800,000 records, systematically filed by letter or pocket system, the key to which lies in the card index, which has more than 10,000 subdivisions. John Smith, bitten by a dog, can find a complete account of that incident years after it occurred; Bill Jones, arrested for robbery and either discharged or convicted, will find that history complete, as the disposition of every case is followed to a conclusion. Records of all accidents, suicides, murders, burglaries, robberies, fires; everything a patrolman or other officer notes on his tour of duty which indicates an infraction of the laws or ordinances, or which may later be of value in litigation; arrests for speeding, for all vehicular offenses, for disturbance of another's peace; liquor raids, automobile thefts, drownings, railroad accidents, gang killings, frauds, embezzlement, houses of prostitution—keepers, inmates and frequenters; gambling houses; correspondence from other departments; men wanted, women wanted; deserters from the U. S. Military Service; lost, strayed or stolen property; —a thousand varieties of daily happenings are to be found in this department. All may be traced instantly, if there is but one name to work by, or the date of happening.

All names mentioned in reports are indexed upon cards indicating their respective class by color, each variety having a separate color. All crimes which may be traced by reason of criminals following a given habit in the commission of crime, are grouped; hence it is easy to remove a pocket from the records and find fifty or a hundred records, all in numerical form according to date, so that the last report indicates the count.

Citizens of St. Louis, familiar with the Police Department, point with pride to the fact that police organizations elsewhere have sent special emissaries to pattern their own new departments after this one

The department is located at Headquarters, and occupies over 700 square feet of floor space, largely occupied by tier after tier of file cases. Situated at the front and extending along the entire room, is a counter at which the applicants for information may jot down such data as required. Much information is issued by telephone. The office force consists of one chief record clerk, fourteen file assistants, and two file indexers. This department is never closed. Day and night, holidays, or Sundays, the operation proceeds in a regular, even manner in the issuance of information to the men in the field, and to this dependable source of information is traced, to a large extent, the success of the department in the apprehension of the criminal element.

MARTIN O'BRIEN,
Chief of Police.

City Managers

Bringing the Government Close to the People

MUSKEGON, MICH.—It has been the intention of the City Commission from its very inception to bring the government as close as possible to the people. In order to do this, it is necessary, first, to keep the City Commission informed on all details of city work so that in its dealings with the public it can speak with authority, give correct information, and avoid the humiliation which is so often due to being unfamiliar with actual conditions. To supply this information, all heads of departments report daily to the secretary of the City Manager at four o'clock in the afternoon. Their combined report is mimeographed and mailed to the City Commission. The entire report can be written and mailed in less than twenty minutes.

The heads of the departments constitute a bureau known as the Efficiency Bureau, the purpose being to accomplish, at the lowest possible cost, the program of the City Commission. The Bureau meets regularly each week and, from its minutes and all data available, submits a quarterly report to the Commission, which is put in such form as to be easily compared with the corresponding period of the year previous. It was found that a quarterly report was far more advantageous than a monthly report, as the comparisons and trend of conditions are more easily comprehended than is the case in the monthly reports or in the evening letters.

The Commission is divided into committees without power to act, but to meet with and advise the City Manager. As the members are continually in contact with the

public, their opinions on public policies cannot be too highly estimated.

In order to bring the entire government a little closer to the public, we have substituted an extra hearing, not required by the charter, on all projects. The committee, with the City Manager and the head of the department under which the project may come, meet with the public interested, on the ground where the work is to be constructed. After the matter has been thoroughly discussed and an agreement reached, it is taken up with the Commission in an official manner. In each case a letter is mimeographed and mailed to each property owner interested. This letter sets up the exact conditions, gives the cost of the project, or the comparative cost of various proposed projects, and really constitutes a sales letter selling the idea to the property owner. This practically eliminates the objector on proposed construction work, at least to such an extent that his neighbors can reply to any argument that he may advance, and creates a good feeling on the part of the property owners.

As for publicity, everything is thrown wide open to the newspaper reporters, trusting to their judgment not to publish anything that will hamper the city in using good business methods.

At the end of the year the Efficiency Bureau drafts an annual report. This report is mimeographed on the back of blueprints, or graphs, presenting the accomplishments of the city for the year, both graphically and analytically. The report shows the trend of conditions over a period of ten years. We have plates made showing the graphs as found in the report, and practically every club and organization in the city is given an illustrated lecture based on the progress of the city. Lectures are also given in practically all the schools. These are followed up with a series of written questions on civics which the students are supposed to get during the series of lectures, and they are given credit for the work done.

The annual report covers the true conditions of the city, both good and bad, as it is intended to correct the attitude of the public, which will change the trend of conditions. By doing this, we have brought the government very close to the people.

I. R. ELLISON,
City Manager.

Water Departments

Yellow Fire Hydrants for Philadelphia

PHILADELPHIA, PA.—After much study, Philadelphia has adopted yellow as the paint for fire hydrants. The selection of a paint of an effective color was a problem that caused the officials of the Water Bureau considerable concern, inasmuch as the damage to fire hydrants during the year, especially by automobiles, runs into large figures.

Yellow paint was decided upon in preference to the dark green or dark brown which has heretofore been used. The new paint was first tried on several of the centrally located fire hydrants, and the innovation was noticed by water bureau officials from all over this country and Canada who happened to be in Philadelphia recently attending the Water Works Convention. They were very favorably impressed by the use of this color when the advantages were brought to their attention.

In making this study, officials of the Water Bureau consulted with firemen, teamsters, automobilists, and persons in charge of traffic. Officials of the Fire Bureau considered yellow the best color because it can be easily seen at night and in foggy or rainy weather. This is a factor on which they lay much stress, as getting started early at a fire depends upon ability to locate the hydrants quickly. Officials of the Police Bureau united on it because they felt it would obviate the excuse offered by automobilists that they did not notice the hydrants when parking. Making the fire hydrants conspicuous will also greatly reduce the damage to them, as they will be seen in time to avoid collision. This is no small item, as prior to adopting this paint a fire hydrant was broken every day by an automobile or other vehicle.

Aside from possessing these advantages, yellow is very restful to the eye, is very durable, and in the case of Philadelphia has the advantage of being one of the two city colors.

CARLETON E. DAVIS
Chief of Bureau of Water.

SOME OF THE AUTOMOBILES PARKED NEAR THE BAND-STAND, LAKE HARRIET, MINNEAPOLIS

Park Departments

Community Singing in Minneapolis

Minneapolis, Minn.—This city has a park system of 4,000 acres and a Board of Park Commissioners which believes in the full use of the parks for the enjoyment of its citizens. In connection with the band concerts by Barrett's Band, and a military band directed by Captain M. M. Jallma, which are given in fifteen neighborhood parks, the city is conducting, under the leadership of Professor Harry Anderson, community sings which are attracting attention all over the country.

The Minneapolis *Daily News* offered a prize banner for the park which had the best record attendance and zeal shown in the sings last year, and Riverside and Logan Parks were tied at the close of the schedule. The tie was sung off at two extra concerts, at which three leading musicians were appointed judges, and Riverside won by a small margin.

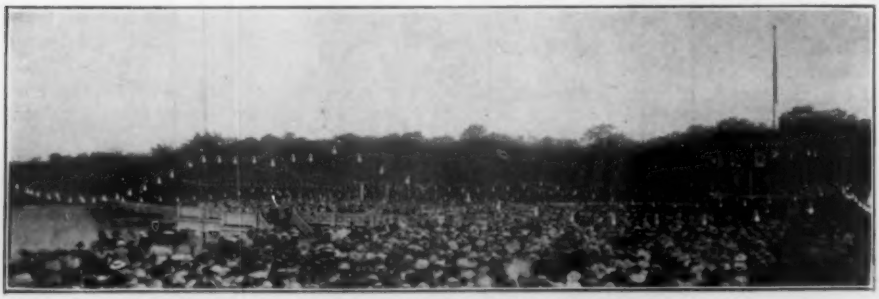
This year the contest is on again and creating a greater interest than heretofore. Another beautiful banner is offered by the *News*, and President Harding has written a letter which will be framed and presented to the winning park together with the banner. The photographs show a part of the audience in Logan Park on a recent evening.

Nothing that Minneapolis has ever done for the pleasure of its people has seemed to reach their hearts more than the concerts and sings. The community sing feature is something in which they can all have a part.

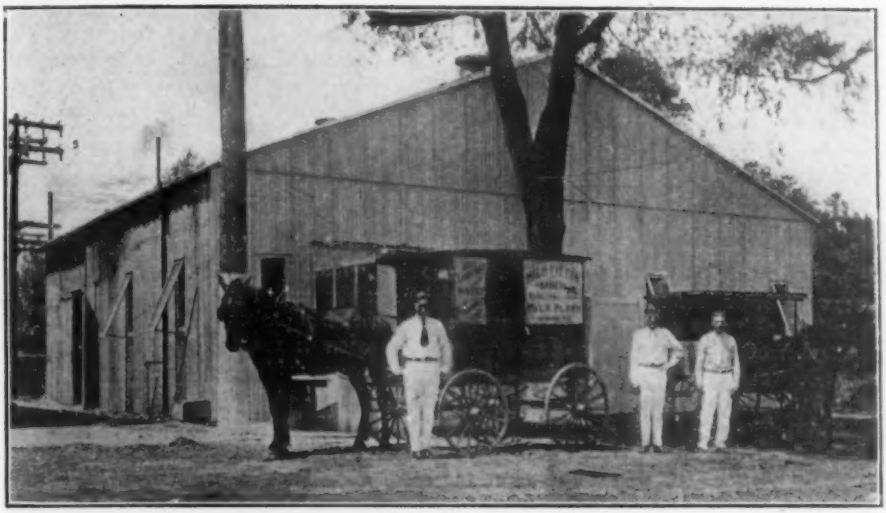
The sings are opened with "America" and closed with "The Star Spangled Banner," with a variety of familiar songs between. New songs are printed on the programs and all are asked to commit them to memory. The season is eight weeks, with a concert in some park each evening, held on a schedule prepared at the beginning of the season.

In these trying times of political and class strife this seems to be a pleasure in which all classes in a community can participate with enjoyment.

J. A. RIDGWAY,
Secretary, Board of Park Commissioners.



ENJOYING THE COMMUNITY SINGING, LAKE HARRIET, MINNEAPOLIS



MUNICIPAL MILK PLANT AND WAGONS, TARBORO, N. C.

City Clerks

Municipal Milk Pasteurization Plant Proves Profitable

TARBORO, N. C.—To those who have been accustomed to thinking of pasteurization plants as possible only in larger communities, the experience of Tarboro, N. C., may come as a surprise. For three and one-half years this small city has had a municipal plant which handles all the milk used in the town, about 1,000 quarts daily. No milk, cream or skimmed milk can be sold in town unless pasteurized. This seems like a temporary municipal monopoly, but the decrease in the death rate of babies and the increase in general health since the installation of the plant have justified it.

The plant itself was installed by Dr. K. E. Miller of the North Carolina State Board of Health and the U. S. Government Health Service. It handles about $30,000 worth of milk yearly, pays expenses, and furnishes the highest quality of milk, delivered at the homes of the people, for 18 cents per quart.

The daily report of the manager shows in detail all information that may be desired for the office of the City Clerk and Treasurer, including the figures of profit and loss each day. Milk tickets are sold to the public, for two reasons: first, milk has to be paid for in cash; and, second, the milk tickets are destroyed daily at the office of the City Clerk, so that no tickets can be used a second time, thereby eliminating the chance of transmitting germs.

In the pasteurization plant the recording thermometer gives an accurate record of the treatment of the milk and, exhibited at the office of the City Clerk each day, assures the public that the safeguard of pasteurization for which they are paying has actually been applied to the milk they drink.

The plant occupies a steel building costing $5,500, with concrete floors, and is painted on the inside with white enamel. It is fitted with electric fans and is completely fly-proof. The manager and his assistants are required to wear white suits. The milk after being bottled is placed in the pasteurizer, carried to 150 degrees Fahrenheit at the rate of 5 degrees per minute, until 150 degrees is reached. There it is held for 5 minutes and then brought down to 145 degrees and held for 30 minutes, and then cooled at the rate of 5 degrees per minute down to 60 degrees.

The delivered price of milk during the past year was brought down to 17 cents and has been still furthered lowered, now selling at 15 cents. The people believe that the pasteurization plant has been a success, and the mortality figures confirm this belief.

J. H. JACOCKS,
City Clerk and Treasurer.

Gainsville Establishes a Publicity Department

Gainesville, Fla.—The organization of the Publicity Department of Gainesville grew out of the fact that we have had considerable trouble in keeping the Chamber of Commerce functioning properly. After careful consideration and discussion with friends and members of the City Council, the following ordinance was introduced and passed, thus creating this department:

"*Section* 1.—The office of Commercial Secretary of the city of Gainesville is hereby created. The duties of this office shall be to advertise and furnish information as to the advantages of this city for the location of homes and establishment of commercial enterprises.

"*Section* 2.—Immediately after the passage and approval of this ordinance the City Council shall elect some suitable person to fill the office of Commercial Secretary, who shall hold office until the first Monday of April, 1922. And on the first Monday of April of each and every year the City Council shall elect some suitable person to fill said office, who shall hold office for a period of one year and until his successor shall be elected and qualified."

We have been operating only about three months and we find that this is a very effectual way to interest the citizens of our city in the progress, development and growth resulting from effectual publicity. It is our duty to handle only matters of publicity, but we have really been doing Chamber of Commerce work as well.

By the city's operating its own Publicity Department, every citizen feels that he has an interest in the work being done, inasmuch as every taxpayer is contributing to the maintenance of this Department.

JOSEPH E. WAUGH,
Secretary, Department of Publicity.

Fire Departments

Last Appearance of Detroit's Fire Horses

Detroit, Mich.—An actual fire-run in Woodward Avenue from the Grand Circus Park to the City Hall, by Engine Company 37, marked the passage of Detroit's last fire horses from active service, and the completion of the process of motorizing the Fire Department. All traffic was cleared from Woodward Avenue, and a reviewing stand was erected in front of the City Hall. There, the Mayor, the Common Council, the Fire Commissioner, and retired officers of the Department were on hand to celebrate the event. Both sides of the Avenue were lined with people and it was estimated that upwards of 50,000 spectators saw the last two teams of horses go down the Avenue while the bells in the City Hall tolled. Then the horses were trotted back up the Avenue at the head of a parade, which included representative types of modern motor apparatus, a motor pumping engine, a ladder truck, a rescue car, and a chief's car. The following day the horses were turned over to the Department of Parks and Boulevards for light work.

The whole ceremony was very impressive. Not the least of the features was the old fireman who received the horses at the City Hall, a man who had been in the service ever since the days of the old hand-drawn and hand-operated trucks.

LEADING THE PARADE UP WOODWARD AVENUE, DETROIT, AFTER THEIR LAST RUN

HARRY BRABYN,
Secretary, Board of Fire Commissioners.

Decatur's New Impounding Reservoir

Annual Water Famine Made a Thing of the Past by Construction of New Storage Reservoir

By E. E. Pierson
Bloomington, Ill.

FOR many years Decatur, Ill., has been threatened with a water famine during each summer. Only recently the Sangamon River, a small stream which flows slowly through central Illinois, has been dammed by the city to form a lake 13 miles long and averaging one-half mile in width, in which is impounded eight billion gallons of water. The dam itself is 30 feet high and 500 feet in length, with long concrete aprons at each end, bringing the total width of the impounding dam to 1,600 feet. Hardly had the dam been completed this spring when the spring rainfall filled the reservoir to capacity.

Two years ago the city was threatened with the loss of some of its leading industries because of the meagerness of the municipal water-supply. This brought concrete evidence of the great need of the undertaking which has just been completed. The financing of the new water-supply, which cost in the neighborhood of $2,000,000, came at a time when banks were declining to make loans, so that the committee in charge was forced to appeal directly to the people for the money. The city could not legally increase the bonded debt, so it became necessary to pay for the improvement through a private company. There were 981 stock subscribers, who invested the entire sum needed within four days after the books were opened, every cent of the stock being paid for. It bears 7 per cent interest. The water rates to consumers were increased to 25 cents per thousand, yielding $125,000 to $135,000 annual revenue. The major portion of this pays the interest and part of the principal each year, so that within twenty years the debt will be paid.

The actual construction of the dam was paid for by the city. The private water-supply company paid $612,000, or from $65 to $200 per acre, for the 4,200 acres of land which became flooded as soon as the lake was created. Where the owners would not sell for a reasonable figure, condemnation suits, 22 in all, were filed. It was necessary to clear the timbered sections within the area of the lake before the water was impounded. This process cost $100,000 more. The timber was felled and given away for firewood.

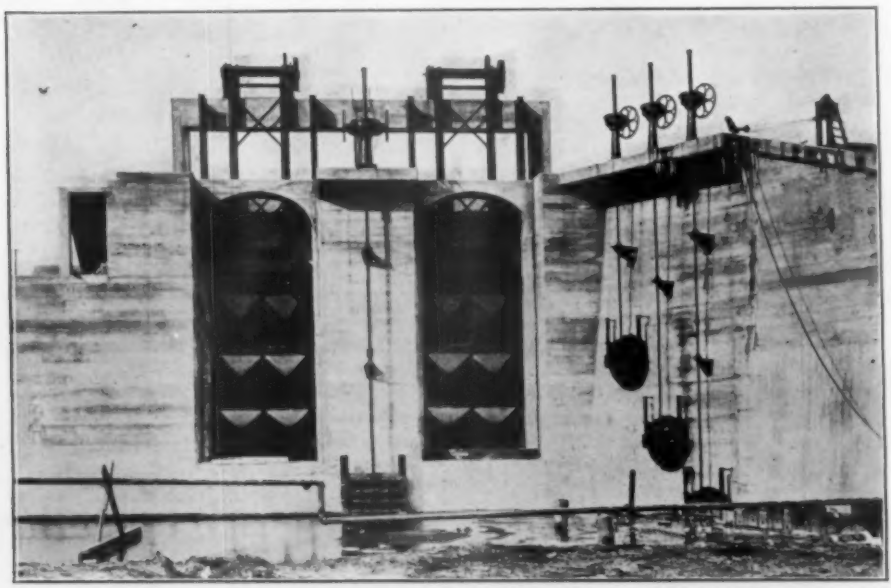
The cost of changing the highways and constructing bridges over the portions of the roads which were flooded, and elevating other bridges to 15 feet above the level of the lake, cost about $500,000. The original water-supply dam was constructed 595 feet above sea-level, and the new dam has raised this elevation 17 feet. The city was forced to acquire all the land within the new contour, so for safety's sake, and to provide for the future, the 615 feet contour was taken as the high-water mark. This included dozens of houses, portions of more than 60 productive farms, and many acres of timber-land. The city authorities, who in every dry summer had been forced to warn the public of the necessity for water conservation, because the only

source of supply was a small river which became a mere trickle in August, are now able to permit water consumption freely, only watching for wasteful consumers.

The city park system will be extended to take in much of the land purchased for the lake. Not less than 2,600 acres will be added for this purpose. Beautiful wooded bluffs, fringing the waterway, have been made into attractive parks for all time.

Building the Dam

To insure the proper foundations for the dam, 26,000 lineal feet of bearing piles were driven under the main dam, and sheath piling was driven the entire 1,100 feet of the earth wings of the dam. In building the concrete spillway and earthen dam, a steel form was suspended within and braced from the timber traveler. This spillway is 22½ feet above the foundation and is 470 feet long. It was constructed in 18-foot sections, each requiring 250 cubic yards of concrete. The concrete construction of the spillway was divided into three stages. Alternate sections of the down-stream apron were placed first and then alternate sections of the 6-foot foundation course, the latter being 30 feet wide and extending 2 feet beyond the up-stream face of the dam. Two longitudinal ribs upon this base formed a key with the body of the dam, and a channel or recess formed a seat for the toe of the curved down-stream face. The third stage was the pouring of the 18-foot sections of the spillway. Vertical recesses 6 x 36 inches were provided to key these sections together. Two recesses in the top of the spillway will permit the hinged steel frames of the flash-board to be lowered during high water. The steel form, 20 feet long, was built up by plates and angles, each plate 1 by 5 feet, having a hole and cover piece so that any number of tie-rods can be placed in any position desired. A wooden bulkhead at one end was held in place by 1-inch tie-rods screwed into malleable iron sleeves attached to rods in the adjacent concreted section of the spillway. Similar sleeves were used also in the 1-inch transverse tie-rods between the front and back faces of the form. These sleeves were placed just inside the form so that the short rods could be unscrewed and the holes filled with concrete or mortar.



CONTROL GATES AT RESERVOIR BEING INSTALLED

To carry the Blaw-Knox steel forms, a traveler 30 feet high and 32 feet wide was built. Each side sill was carried by four

9-inch double-flanged wheels riding upon a rail, spiked to timber stringers laid upon the concrete base course. Suspension rods and brace rods with adjusting ratchets held the form in position, the concrete toe being secured also by a timber fitted to bolts, embedded in the concrete base. The concrete was transported upon a trestle erected across the river near the dam. The spillway was built by coffer-dam construction of sheet steel piling. All the piles were driven from a trestle built inside the coffer-dam.

Pearse, Greeley & Hansen, Chicago, Ill., were the consulting engineers for this work, J. Albert Holmes being the resident engineer in charge of construction. The work was let to C. M. Cope of Decatur, for whom J. J. McCabe was superintendent on the job.

Reducing Water Losses in Indiana Cities

A NUMBER of interesting examples of reduction of losses of water and how they have been checked up through the installation of water-meters were brought out at the March meeting of the Indiana Sanitary and Water Supply Association. E. J. Jenkins, Manager, East Chicago Water Company, reported that meters reduced the consumption in East Chicago from more than 200 gallons per capita daily, late in 1920, to 70 gallons per capita in 1921, when the amount of water unaccounted for amounted to only 12 per cent. The Vice-President of the Gary Heat, Light and Water Company, said that 83 per cent of the water pumped through that system, which is only 50 per cent metered, could not be accounted for. At North Manchester the loss is only 6.77 per cent. W. S. Cramer, Chief Engineer, Lexington, Ky., reported that that city, which was the first all-metered city in the United States, has 16½ per cent loss.

Whiting, Ind., has no meters. In 1920 the consumption was 4.2 million gallons daily, or 420 gallons per capita. A house-to-house survey disclosed 700 leaking toilet fixtures. The consumption was reduced by 1,000,000 gallons daily after repairs to the services were made and a few large leaks in mains were shut off. The use of meters might still further reduce the consumption.

Michigan Counties to Support Public Health Nurses

Supervisors Are Taking Over Public Health Work from the Red Cross

IN Michigan forty-six of the eighty-three counties have public health nursing agencies carrying on definite work, with from one to fifteen nurses. In twelve counties the Board of Supervisors have taken over the public health nursing programs, and four others are partially supported by taxation. Twelve counties have requested the State Department of Health to secure public health nurses to start their programs, and in twenty-six others supervisors will be asked by the Red Cross to take over their county nursing programs this year.

In inducing supervisors to support the work, public health authorities have been able to cite many instances where nurses have helped to prevent disease and save lives. John Smith, Jr., for instance, one month old, obviously not well, is being fed condensed milk, though the farm's Duroc-Jerseys were given 10 or 12 gallons of skim milk twice daily. The county health nurse called on the young mother to explain to her that the baby's diet was at fault, and saved the child's life. Another child, three years old and several pounds underweight, was put on a whole milk diet. To-day both children are well.

Mapleleaf School, in another county, was attended by twenty pupils from twelve different families. The morning the county nurse visited the school a new pupil whose parents had just moved into the community was being admitted. Throat swabs which the nurse took of all the children revealed that the new scholar was a "carrier of virulent diphtheria organisms." He was excluded from the school, and the possibility of diphtheria's developing among the children, with its attendant toll of lives, was thus narrowly averted and again the value of the nurse demonstrated.

Fire Regulations Undergoing Changes in Many Cities

Study of Causes Leading to Adoption of Fire-safe Roofs Throughout the Country

DURING the five years 1916 to 1920, Americans have been burning up property at the rate of $334,544,535 a year, according to the National Board of Fire Underwriters, which has been making a study of more than 3,000,000 fires occurring within that time. The total loss, for the period, of $1,672,722,677 would, according to engineering authorities, be sufficient to build 334,000 dwellings at $5,000 each—enough housing to care for 1,700,000 persons. This is equivalent to the combined population of Connecticut, Nevada and Wyoming.

The figures show that the value of property destroyed by fires communicated through the roof was $223,000,000. Study of these and similar figures are leading to drastic changes in fire regulations in many cities of the country. Roof fires are among those considered easily preventable, and steps are being taken with that end in view. Fire department records in many cities show that about 40 per cent of all conflagrations have resulted from sparks and flaming embers carried by high winds to the roofs of near-by buildings. It is declared that if proper care had been exercised and fire-resistant roofing materials had been used when these buildings were erected, most of the losses would have been averted.

In the early part of last year the citizens of Indianapolis, Ind., began a campaign of fire prevention. Before the campaign was launched, city officials joined with representatives of the Indianapolis Chamber of Commerce in gathering information. A fire prevention campaign had been conducted in Cincinnati, Ohio, where it was found there had been 1,872 fires during 1920. Indianapolis had suffered 3,465 conflagrations the same year, notwithstanding that the Hoosier capital was then only half as large as Cincinnati and had approximately only one-half its property valuation. Cincinnati had only 56 roof fires that year, while Indianapolis had 1,400. The net result of the Indianapolis campaign for fire-safe roofs was a reduction in 1921 of $550,000 in losses and 350 in the number of fires. Of 1,199 fires in Indianapolis reported by Fire Chief O'Brien of that city in 1922, 850 were still directly chargeable to inflammable roofing. New York City and Chicago were the only cities leading Indianapolis in the number of fires during the year.

"In the year 1911," says Fire Chief O'Brien, "Indianapolis had a fire loss of somewhat over $300,000 and a total of less than 1,700 fire alarms. This fire loss increased by leaps and bounds year after year, until we reached a loss of more than $1,800,000 in 1920, with a grand total of 3,465 fires." The increase in fires, he says, necessitated the constant enlargement of the Fire Department, until the cost of maintenance reached $1,000,000 a year. An ordinance has been introduced in the Indianapolis City Council providing for the elimination of all wooden shingle roofs within eight years.

Fire department records in Wabash, Ind., show that of 30 fires in that city from January 1 to March 1 this year, 25 were due to wooden shingle roofs. As in Indianapolis and Cincinnati, many old shingle roofs in Wabash are being covered or replaced with asphalt or other fire-retardant or non-combustible roofing.

The cities and towns in this country now requiring fire-resisting roofing within their fire limits represent practically all sections of the country. Among them are: Birmingham and Montgomery, Ala.; Wilmington, Del.; Jacksonville and Tampa, Fla.; Augusta, Columbus, and Savannah, Ga.; New Orleans, La.; Cambridge, Chelsea, Fall River, Lawrence, Lexington, Lynn, Newton, Salem, and Somerville, Mass.; Hoboken, Jersey City, Newark, Paterson, Perth Amboy, and Trenton, N. J.; Allentown, Easton, and Reading, Pa.; Charleston, S. C.; El Paso and Paris, Tex.; Norfolk and Portsmouth, Va.

What City Planning Means to Raleigh

By T. B. Eldridge
Mayor, Raleigh, N. C.

EDITORIAL NOTE.—*The following statement by Mayor Eldridge was included in a pamphlet issued by the city of Raleigh early in 1922, which contained a copy of the act of the Legislature authorizing cities to appoint city planning commissions, a copy of the Raleigh ordinance authorizing the appointment of the Raleigh City Planning Commission, and then the Mayor's statement on the need for action. The pamphlet, which was compact and designed to fit an ordinary envelope, aroused so much interest, and the Mayor's statement is so constructive and with minor changes so applicable to many communities, that* THE AMERICAN CITY *has obtained his permission to reprint it in full. Since this was written, an appropriation of* $3,000 *has been made for the preliminary work of city planning and zoning, and Jefferson C. Grinnalds has been engaged as consultant to the Commission.*

CITY planning is a phase of municipal activity that has been neglected entirely too long in Raleigh. It should have been begun a hundred years ago. Had there been a municipal planning commission functioning when the town began to outgrow its original limits, certain conditions that exist to our regret to-day and which must be corrected to-morrow, could not have happened. Consider Halifax Street—an avenue of magnificent width for a few blocks from the Capitol, and then suddenly narrowed to the dimensions of little more than a lane. Look at Fayetteville Street—the southern counterpart of Halifax—a street to inspire us with pride, till it strikes an obstruction, shoots off at an angle, greatly contracted in width, and then by sundry crooks and turns finds its way to the open country.

Had a city planning board been operating in Raleigh a century ago, the railroads would not have been allowed to cut across street extensions without providing bridges or underpasses. Observe what happened to Edenton Street and Lane Street. Take a position on Blount Street near the Governor's Mansion and look northward. The County Home is in full view and Blount Street ought to lead right up to its doors; but walk or drive a little further, and two railroads are found to cut off progress in that direction as effectually as though the space were occupied by a river with neither bridge nor ferry. There is no way to get across without flying. A viaduct at this point is a positive necessity for the future. A city planning board, when the North Carolina Railroad was constructed, would have relieved the present generation of the problem of bridging the tracks at Ashe Avenue, and on the other hand never would have permitted the dangerous grade crossing at Park Avenue.

Take another instance of misdirected municipal development, namely, Hillsboro Street westward from the Oberlin Road. The greatly decreased width of the street at this point is an ugly disfigurement of the city's most important avenue, an obstacle to vehicle travel, and a handicap to the westward development of the city. Sooner or later this street will have to be widened; indeed, the full width of Hillsboro Street should be continued to Method. The question arises whether to attack the problem now or defer it until property values are enhanced and the cost of the improvement greatly increased. The City Planning Commission will have to tackle the question.

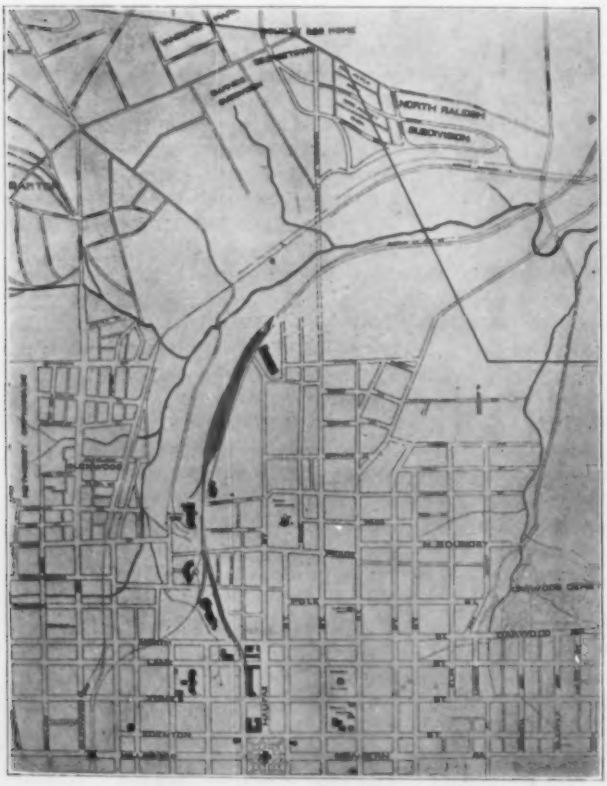
Consider what might have been the possibilities of westward expansion if the State Fair had been located somewhere other than on Hillsboro Street. The inevitable growth of the city in that direction should have been foreseen; but the men of a generation ago apparently had no vision of the big town Raleigh has now become, and the bigger town it soon will be. It may not be worth while to wish that the Fair had been moved a little off from the main road, but it is plain enough that its situation presents one of the most diffi-

cult problems that will claim the attention of the Planning Commission.

Take another phase of misdirected municipal expansion. Behold the crazy-quilt patches that have been stuck on the sides and hung on the corners of the original city plan, without thought of the effect on the future city. There is some argument in favor of streets following the contour of the land, and there is no denying that curves are more pleasing to the eye than straight lines; but contours and curves without regard to a harmonious whole make and multiply difficult situations that some day will prove costly to the city. By and by it will become a municipal necessity to disregard contours and run straight lines through curves; and great will be the cost thereof. Even to-day, within a bowshot of the heart of the city, streets are being laid out and graded very much as though the owners of the property regarded the making of streets nobody's business but their own. Such things ought not to be, and, with an efficient City Planning Commission functioning in Raleigh, such a situation cannot happen again.

Give the kaleidoscope another turn—and what do we see? Streets that start somewhere, traverse a few blocks, and get nowhere; streets that were laid off for no earthly purpose but to sell building lots; streets with more dead ends than anything else; streets that start and stop, that skip intervening space and begin again, go on farther, and then give up in despair of making a worth-while connection. Look around. They are almost everywhere in Raleigh.

Once more. There are cities whose principal claim to consideration is the facilities they offer for getting in town and getting out again. Raleigh is not in that class, which may be a disadvantage or otherwise, according to the point of view. Think of Glenwood Avenue as the only outlet northward, or of Hillsboro Street, which serves the same purpose on the western side of the city. Fortunately, there are possibilities of northward communication through St. Mary's Street and Oberlin Road; but who except a city planning engineer can show us another way in or out to the west? It is said of a railroad that its roadway and equipment are valueless without terminal facilities. A city without sufficient gateways is a parallel case.

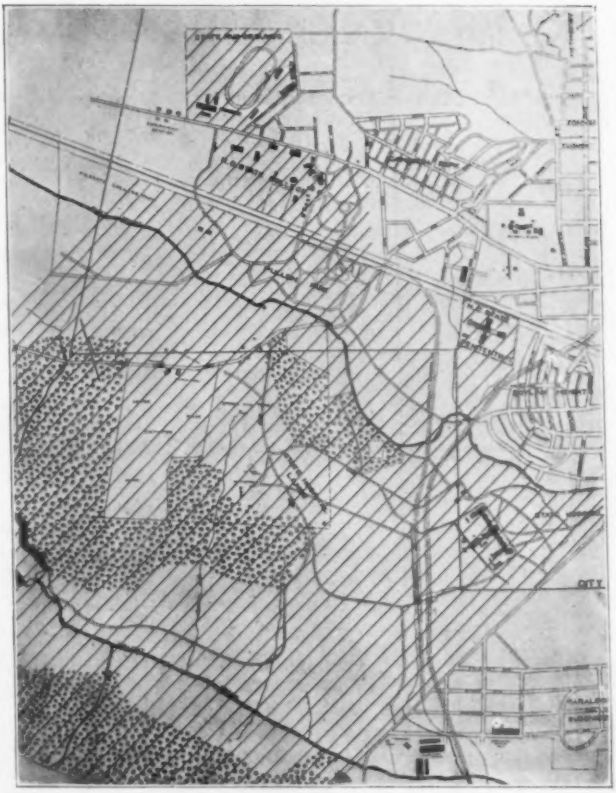


NORTHEAST CORNER OF RALEIGH, N. C.
Showing how the continuity of the streets is interrupted by railroads

The wealth of Raleigh in parks and unimproved park spaces is little understood by the average citizen. Everybody knows about Pullen Park, Nash Square, and Moore

Square. There are a number of others that have been dedicated to public use, but hardly recognized by the powers that be or that have been. and there are other spaces of no practical value to the owners that could be made beauty spots for the future big town that Raleigh is certain to become. Park improvement on a large scale may well be deferred until the city becomes more populous and wealthy, but it is the part of wisdom now to get a line on what we have and preserve it from abuse or encroachment. The acquisition of additional park areas will be a stroke of municipal statesmanship.

But whatever park problems are left to the care of to-morrow, there should be no such policy toward the two squares in the heart of the city. Nash Square necessarily makes the first impression on visitors arriving by railroad. Imagine what kind of impression! Nash Square to-day is little more than an open space and an opportunity. Moore Square is a network of by-paths and a convenient place for the display of second-hand wearing apparel. A City Planning Commission would win its way to the hearts of the people by rescuing these squares from their state of neglect.



SOUTHWEST CORNER OF THE CITY

Showing how expansion is made impossible by publicly owned property. Note the street between the State College and th State Fair Grounds, the only outlet to the west on a boundary of two miles

The City Planning Commission will take notice that there are no playgrounds in the city and no playground equipment except a few pieces in certain school yards.

Zoning—what does it mean? Well, it exists in Raleigh to-day to a limited extent in the restrictions applied to the construction of buildings in what is called the fire district. But zoning goes a long way beyond that. The zoning power may prohibit one from building a garage on the street line close to his neighbor's house. Exercise of the zoning power would have prevented the disfigurement of splendid residential districts in ways that have already happened by the encroachments of business and trade. Briefly, the zoning power gives authority to establish districts and place reasonable limitations on the use that may be made of property therein. It compels selfish interests to yield to the general welfare. It requires the few to respect the rights of the many. It is designed to conserve health, promote happiness, and serve the best interests of the community.

The foregoing is not an argument: it is an abbreviated statement of some of the reasons why Raleigh should get into a movement that hundreds of progressive cities have found essential to their systematic growth, harmonious development, and the welfare of their citizens. The necessity for this statement consists in the fact that it is an entirely new proposition so far as the citizens of Raleigh are concerned.

Reducing the Cost of Fire Protection

Report of Former Commissioner of Public Safety, St. Paul, Minn., Contains Pertinent Facts Worth Studying

THE Bureau of Fire of the Department of Public Safety, St. Paul, Minn., spends approximately 10 per cent of the city budget every year. It has been admitted in the past that the cost of fire protection was abnormally high in certain districts, but the exact cost was not available because expenditures were shown only in aggregate form. During the year 1921, the first attempt was made to show the cost of fire protection by the individual companies and to compare them with the work performed.

The Fire Department now consists of 37 companies. The cost of maintaining them during 1921 amounted to $856,640.92. They answered 2,192 calls during the year, the companies making 6,375 runs. In other words, three companies on the average responded to each alarm. The number of runs by individual companies varied from 716 to 42, the average being 172 runs. The cost per run during the year 1921 ranged from $32.14 to $531.16, averaging $134.37.

Bearing in mind that each fire was attended by not less than three companies, the cost of fire protection based upon the number of alarms turned in was about $391 for each alarm. Considering further, that out of a total of 2,192 alarms, there were only 1,254 building fires, the other alarms consisting of grass fires, false alarms, etc., the average cost of fighting building fires was nearly $700.

An interesting example of how the cost of fire protection can be reduced is shown in the case of Engine House No. 21, where the company consists of a force of 12 men, 5 horses, and one old-style steamer and hose cart. This company made 42 runs for the entire year, the cost being $531.16 per run. This condition has been remedied, reducing fire protection costs by about 35 per cent in this district. It was proved to the residents of the district that the horse-driven company was not giving them the fire protection they thought they were getting, because a motor apparatus located on the other side of the river would reach practically every fire in the district served by Engine House No. 21 quicker than the horse-drawn company. For this reason the horse-drawn steamer apparatus was replaced by a modern hose and chemical motor-driven apparatus which reaches the fire within a few minutes after the alarm is turned in and extinguishes the blaze before it has an opportunity to do much damage. From a financial standpoint the figures given below illustrate convincingly the saving which has been accomplished, in addition to better fire protection:

	Men Employed	Salaries Paid	Other Expenses	Total
Expenditures in 1921 of the No. 21 Engine Company	12	$20,022.52	$2,306.26	$22,308.78
Estimated expenditures for 1922 of the No. 21 Engine Company	8	13,860.00	750.00	14,610.00
Saving for 1922	4	$6,162.52	$1,556.26	$7,698.78

Analysis of Economy of Motorization

The benefits to be derived from complete motorization have been discussed by the Bureau of Fire upon various occasions. Last year when $100,000 was asked to accomplish this, the request was turned down even after figures had been submitted proving that the original outlay could be saved on the reduced maintenance cost inside of two or three years. The following analysis based on costs of maintaining fire companies in St. Paul shows forcefully the savings which could have been effected with complete motorization:

Average total of all costs of the 10 companies with the horse-driven equipment, per year	$24,021.49
Average total of all costs of the 8 companies with fully motorized apparatus, per year	21,888.91
Saving in operating costs of companies with motorized apparatus, per year	$ 2,132.58

While the motorized companies each cost $2,132.58 less for up-keep and answered 174 alarms, traveling 382 miles, the companies with the horse-drawn apparatus answered 105 alarms and traveled only 185 miles. The

cost per alarm answered by the motorized company was $125.62, while each alarm answered by the horse-driven companies cost $227.91, or almost double. Bearing in mind the increased efficiency of motorized companies, the present ten companies in St. Paul with the horse-drawn apparatus could be replaced by nine companies with up-to-date fire-fighting equipment, saving $24,000, besides giving better fire protection. The effect of complete motorization as to savings on operating expenses results in the following summary:

Saving on operating costs of the proposed 9 motorized companies at $2,132.00....	$19,188.00
Saving effected by discontinuing one company	24,020.00
Total saving each year effected by motorization	$43,208.00

While there is a little saving made in the operating cost of the company with the tractorized steamer engines, it is negligible, because the largest item of expenditure, the salaries, remains the same whether the steamer is tractorized or not. The steamer engine company required 14 men for the double shift. This was reduced to 13 men on the horse-driven companies, which is one man below the National Board of Fire Underwriters requirements. The up-to-date motor pumper and hose cart required the attendance of only 12 men for the two shifts. The tractor-drawn steamer companies are located mostly in the high-value districts, where it is not advisable to cut the force down, and, therefore, the services of 10 men are needed that could be dispensed with if these companies were fully motorized. The present average cost of companies with tractorized steamers is $26,005.27, or $4,116.35 more than the cost of a modernly equipped company.

One redeeming quality of tractor-drawn steamers is that their work at fires is on a par with fully motorized apparatus, and the number of alarms answered is also practically the same.

The Fire Repair Shop

The fire repair shop is now operating under a rational cost accounting system, with C. L. Willis as Superintendent of Apparatus and L. Posch and William A. Milner in charge. One feature of the cost of repairing the fire apparatus is that unless the apparatus has an accident in going to the fire, the cost of regular repairs and maintenance is very low. This is in spite of the fact that it is essential to keep the fire equipment in the very best possible condition. Minor defects that could be overlooked on trucks or automobiles used for other purposes must be immediately taken care of on fire apparatus. Furthermore, the repair parts are specially made and are therefore quite expensive.

Cost of Operating Fire Apparatus

Basing the performance of the fire apparatus upon the length of time it works at fires, the cost per working hour is as follows:

Triple combination motor-driven pumpers—750 gallons per minute	$3.66
Double combination motor-driven pumpers—900 gallons per minute	5.49
Tractorized steamers—600-800 gallons per minute	7.57
Horse-drawn steamers—550-700 gallons per minute	2.26
Squad automobiles	6.18
Chemical trucks	5.96
Hook and ladder trucks	5.22
Motor-driven hose carts (accompanying tractorized steamers)	3.16

Although a detailed statement was prepared also showing the cost based upon the fire calls made, the above table showing the cost on the basis of hours worked is more equitable, because there is wear and tear not only on the apparatus while going to the fire, but also upon the pumping machinery when operating at the fire.

The statement of operating cost of horse-drawn steamers is somewhat incomplete inasmuch as although the motor-driven apparatus is also charged with the motive power, that is, the gasoline, it is not practicable to apply the cost of horse up-keep to the actual work the apparatus performs at fires. The same also applies to coal which is used for heating the engine heaters. It is this class of expenditure which costs the fire department approximately $1,000 more for the maintenance of each horse-drawn company, because these costs are incurred like any other fixed charges, even if the engine did not turn a wheel for the whole year.

The Value and Importance of Fire Alarm Boxes

During the last two years there have been 45 new boxes placed in different parts of the city. This represents a greater increase in this item of fire protection than has been made in the eight years previous. In the last report of the Investigating Committee

of the National Board of Fire Underwriters, there is a recommendation made for the installation of at least one hundred new fire alarm boxes in St. Paul. It is only reasonable to base the need for improvement upon the value such improvements will be to the community, and therefore the service rendered by the fire alarm boxes now installed should indicate to some extent whether more fire alarm boxes should be placed in service.

The schedule below shows the various kinds of fire alarm calls turned in for the last three years:

	1921	1920	1919
Fire alarm box calls	147	130	97
Telephone calls	1,983	2,066	1,423
Other calls	62	63	48
Total	2,192	2,259	1,562
Percentage of box calls from the total amount of calls	6.7%	5.7%	6%

In 1920 a list was made showing the number of calls sent over the individual fire alarm boxes. This is tabulated above:

Number of boxes that sent in 7 fire calls	1
Number of boxes that sent in 5 fire calls	3
Number of boxes that sent in 4 fire calls	2
Number of boxes that sent in 3 fire calls	3
Number of boxes that sent in 2 fire calls	20
Number of boxes that sent in 1 fire call	51
Number of boxes that sent in no fire calls	194

Six per cent of all alarms sent in over the fire alarm boxes does not speak very well for the use the public is getting out of them. This is due to the fact that every house has a telephone these days, and that in itself accounts for the 93 per cent of all alarms being sent over this much more accessible means of communication with the fire alarm office. However, this should not militate against the installation of boxes in every school, motion picture house, theater, public building and public hall, and a sufficient number throughout the city to make it possible to send in fire alarm calls expeditiously. Furthermore, the public should be educated to use the fire alarm boxes rather than the telephone, as the spoken word is so unreliable in times of excitement.

Repairing Asphalt Streets in Winter

Timely Suggestions That Preparation May Be Made Before Cold Weather Arrives

A METHOD of repairing asphalt pavements during the winter months, when municipal and county asphalt plants usually are closed down, has been evolved with success by Charles L. Harrison, engineer in charge of street repairs at Cincinnati.

The old asphalt pavement is removed from the streets and hauled to the yards during the regular working season, the pavement being broken down to approximately 2½ inches. The heating plant consists of four horizontal four-wheeled kettles, each of 100-gallon capacity. The old asphalt, broken to proper size, is placed in the kettles in the afternoon and the fire started at 5 o'clock the next morning. Four or five gallons of water are added and the covers are placed on the kettles. After being allowed to steam for half an hour, the mixture is turned over with heavy bars, is spaded at one end and then allowed to steam again. The operation is repeated until at the end of three hours the water has evaporated and the mixture is ready for use at a temperature of 325 to 375 degrees Fahrenheit. It is then transferred to another kettle, under which a hot fire has been built, and is hauled therein to the street, where it is laid in the same manner as "new stuff," except that it is tamped into place instead of being rolled. The four kettles are never allowed to be more than half full, as the mixing cannot be done in an economical manner if the kettles are full.

The force engaged in breaking, heating and laying the asphalt in Cincinnati consists of only the seven men who are kept during the winter as the nucleus for the spring force and a driver for a two-horse wagon. No additional bitumen or dust filler is added to the old asphalt, and the cost is slightly less than the average cost per square yard for repairs with new material.

Why Crime Decreased in Detroit

By Arch Mandel
Detroit Bureau of Government Research

MAJOR crimes in Detroit decreased 58 per cent in 1921 as compared with the 1920 record. The crimes referred to are robbery, breaking and entering, and larceny from the person. This is a good record in crime reduction, and "one that is not nearly equalled by any other large city in the United States." This statement is made by the Commissioner of Police in Detroit after a comparison of data received from the six principal cities of the country. Why this reduction in 1921 to a point not only below that of 1920, but also below the record of 1918, the war year, when crime in Detroit had reached its lowest level for many a year?

The reasons for increase or decrease of crime are many and varied, but the greatest factor responsible for its decrease in Detroit is probably the one mentioned by the Police Commissioner in his last annual report, which states that the good record in 1921 "is due to the harmony and cooperation which have existed during the past year between the Recorder's Court, the Prosecuting Attorney's office, and the Police Department." The relationship among these agencies is all that could be desired from a law-enforcement point of view. There is a determination on their part to cut down crime, and this determination manifests itself not only in intent, but in action. They are working together with a common purpose.

It is undoubtedly true that the sensitiveness of professional criminals and would-be criminals to aggressive law enforcement has kept them away from Detroit. The knowledge that the Police Department is persistent in its follow-up of crime and that a conviction in court means a long prison sentence, contributed largely to the 1921 record. Detroit used to be known among crooks as an "easy town," and now they write each other to stay away from Detroit because the authorities mean business.

Determined Citizenship, the Motive Force

Naturally, there is a force behind this determined activity on the part of the law-enforcing departments. This force is an articulate citizenship that has placed in power an aggressive, clean, and effective city government; an administration that is as non-political as it is practically possible to make it. The Mayor, with no political axe to grind, is interested solely in the efficient conduct of the city's affairs, and the only thing he demands of his department heads is a strict performance of the duties with which they are charged.

The Police Department is operated by the Police Commissioner, who is not obliged to cater to any particular group in the community. Politics are eliminated. This means that the men are selected and promoted to

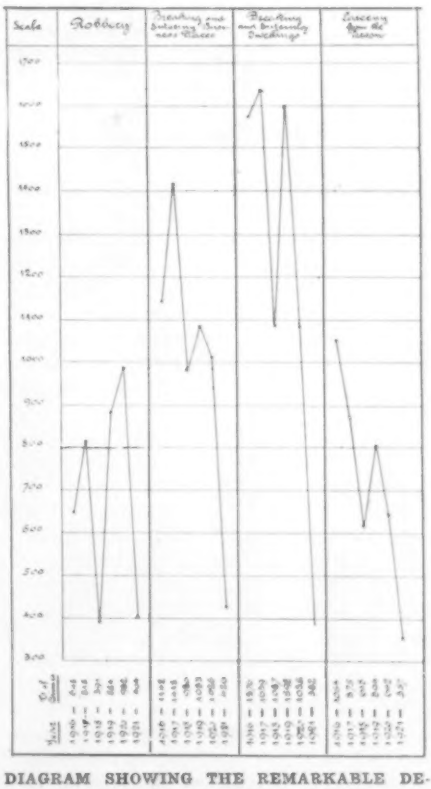


DIAGRAM SHOWING THE REMARKABLE DECREASE IN CRIME IN DETROIT

their jobs because of their fitness. Pull is no substitute for merit. Policemen are not in fear of being reprimanded, transferred, demoted, or losing their jobs because of possible offense to influential interests or persons in the performance of their duties. All that the men have to worry about is faithful attention to their duty.

A lawbreaker is a lawbreaker, regardless of affiliations or connections. As far as can be observed, the Detroit Police Department employs conventional methods known or practised by the large city police departments. Such practises as maintaining a continual watchfulness over banks by automobiles patrolling from one bank to another as many times a day as possible, and the use of high-powered automobiles, fully manned, which respond to calls as quickly as does the fire department apparatus, are evidence of alertness on the part of the department, rather than an innovation of unusual or brand-new methods. There is no doubt, however, that the support given the rank and file of the Police Department has put the men on their mettle and has created a morale which bodes ill for lawbreakers in Detroit.

Police Must Have Cooperation

It is agreed, however, that the Police Department is powerless to check or curb crime if the other agencies of the law-enforcing branch of the Government do not function properly. The apprehension of criminals is of little value if it does not bear fruit in the form of expeditious and decisive action on the part of the courts and the prosecuting attorney. The Detroit Police Department has had such cooperation.

Delay in disposing of criminal cases tends to defeat the purposes of the law. Punishment may be severe or lenient, but it should be swift and certain. When months, and frequently years, elapse before defendants are brought to trial, witnesses disappear, the circumstances of the case become indistinct, and the normal interest necessary to try a defendant with justice is lacking. Furthermore, the uncertainty of punishment tends to encourage an attitude of indifference, and even of contempt, on the part of criminals. It seems, therefore, that a prime requisite to the proper functioning of a criminal court is to dispose of its cases as expeditiously as possible, not alone to punish the guilty, but to vindicate the innocent. In Detroit, prompt trials have prevailed in the last two years.

The following table compares the length of time it took for cases to be disposed of in the criminal court of Detroit in 1921 and 1919:

Comparative Table Showing the Time Consumed in Disposing of Felonies Under the Old Court Organization and the New

	1919		1921		Cumulative	
Weeks	Cases	%	Cases	%	1919 %	1920 %
1	31	2	2189	66	2	66
2	61	3	203	6	5	72
3	95	5	154	5	10	77
4	105	5	252	7	15	84
5	114	6	197	6	21	90
6	123	6	138	4	27	94
7	132	7	64	2	34	96
8	128	6	42	1	40	97
9	171	19	31	7	59	98
Over 9 Wks.	688	41	68	2	100	100
	1648	100	3338	100		

The above analysis of 3,338 felonies originating in the court since April 1, 1921, shows that 66 per cent were disposed of within 7 days, including Sundays and holidays, from the time of the arraignment on the warrant through the trial. In 1919 only 2 per cent of the cases were disposed of within that length of time. At the end of four weeks, 84 per cent of the cases were disposed of in 1921; in 1919, only 15 per cent.

How the Results Were Achieved

It may be interesting to know what makes possible speed and certainty of punishment. Wherein does the Detroit criminal court system differ from that of other cities and from Detroit's former system?

Prior to April 20, 1920, Detroit had the usual inferior and superior criminal courts, the Police Court and the Recorder's Court; the former having jurisdiction over the misdemeanors and over the arraignment and examination of felony cases, and the latter over the trial of felony cases and, because it was a city court, over ordinance cases. There were five judges, three in the Police Court and two in the Recorder's Court, each an independent and coordinate unit.

The law creating the new court provides the following features absent under the old dual organization:

1. A unified criminal court for Detroit. The Police Court was merged with the Recorder's Court.
2. A presiding judge, chosen by the whole

bench of seven judges for such term as is agreed upon, who "shall be charged with the general supervision and superintendence of the work of the court."

3. Power to establish and maintain specialized branches or divisions, as may be deemed proper and expedient by a majority of the judges.

4. Seven judges instead of five, with equal powers and jurisdiction.

5. Psychopathic clinic.

Of these distinctive features, the first two mentioned are primarily responsible for the improved functioning of the court. The responsibility for the handling of all criminal cases from beginning to end being vested in one court, an organization that is operated as a singular administrative unit under the "general supervision" of a presiding judge, has made for expeditiousness. Furthermore, assignment of cases by a presiding judge has permitted uniform distribution, eliminating congestion in any one division.

The benefit of unification is further exemplified by the fact that out of 2,487 felony cases where the defendants pleaded guilty, 1,539, or 62 per cent, were disposed of on the same day. This would have been impossible under the old dual organization of an inferior and a superior criminal court.

Justice Not Sacrificed to Speed

It is not intended to give the impression that everything is sacrificed to speed. Adequate time is given for preparation of cases, and adjournments are granted when necessary, but the usual dilatory methods are not tolerated or encouraged.

The Recorder's Court, in the last two years, has treated convicted persons, particularly those found guilty of robbery or burglary, more severely than was the practice heretofore, and has been criticised in some quarters for its uniform severity in these cases. The value or justice of short or long prison sentences is a moot question, and need not be discussed here. There is less crime in Detroit.

However, there is ample evidence that the court is making an earnest effort to dispose of cases so that the greatest good will accrue both to the community and to the individual sentenced. In the first place, an increasing number of offenders are being placed on probation. Secondly, but of greater import, is the use being made by the judges of the psychopathic clinic which is an integral part of the court. This clinic, under the direction of Dr. A. L. Jacoby, an experienced and competent psychiatrist, although in operation but a little over a year, has already demonstrated its possibilities for service.

In the last twelve months the clinic examined over 300 cases, men and women charged with felonies and misdemeanors. Before imposing sentence upon these offenders, the judges had before them a complete social history of the individual compiled by investigators of the clinic, a diagnosis of the physical and mental conditions, together with recommendations for treatment based upon the findings. It is the object of the clinic not only to give diagnoses in special cases, but to build up cumulative data that will indicate to the court and to all the law-enforcing agencies how and what constructive work can be done in reducing criminality and crime.

As the third side of the triangle, the prosecuting attorney's office has performed its function in the interests of law-enforcement. Cases are not lost, pigeon-holed, or played with. They are prepared for trial and tried without delay. In other words, the prosecuting attorney's office does nothing that will prevent a case from being tried or that will retard the progress of a case.

Improvement in Jury System

Another innovation in the Detroit criminology machinery worthy of mention is the improved character of the juror, made possible by the enactment of a new law in 1920. Prior to this time, jurors were required to serve for two months in the Recorder's Court, which meant that men with responsible positions were precluded from serving. The new law, sponsored by some of the judges of the Recorder's Court, reduced the term of service to two weeks, and, as a result, citizens from all walks of life are serving as jurors. The juries are more representative now, in that they also include the intelligent element of the community.

There is criticism of the court; but that is natural, because criticism always accompanies innovations. So long as such criticism is constructive and has as its main object improvement in a new and untried project rather than destruction because of supposedly minor defects, it is welcome and

is a wholesome sign. Prior to the reorganization of the court, nobody paid any attention to the courts, and if there was less criticism than at present it was not because the administration of justice was perfect.

The reading of this article would lead to the conclusion that the low crime rate in Detroit is due to the method in which the agencies of criminal justice are functioned. Whether it is entirely due to that or not, it is difficult to state, because the causes of crime are many and complex. The fact remains, however, that the courts, the Prosecuting Attorney's office, and the Police Department are pursuing effective methods, and crime is low.

Forecasting the Future of a City

MANY city officials and chamber of commerce executives may be unaware that the Bell Telephone System has for years been making forecasts as to the growth of cities and planning for future telephonic developments in accordance with such predicted growth. The telephone company's engineers have been obliged to make their predictions not merely general but specific. By detailed studies of the cities in which their plants are located, they have been able to predict the change in the character of neighborhoods, location of new business centers and new industrial developments, suburban home sites, and the character of the population which will probably occupy the community six, twelve or twenty years hence. They have made an analysis of the city, know how many families it has, how many of them live in apartments, how many in flats and how many in separate residences, and have divided them into types based upon the amount of house rent they pay each month. Out of such data the engineer prepares his predictions in order that the company may develop its fundamental telephone system and anticipate the need for local service areas in the future.

From the subscriber's standpoint as well as from the company's, this service is important, for it means the refinement of guesswork in the matter of preparing for current capital investment for future needs. The company must be prepared to render service when the demand arises. It cannot wait for the demand to lay its cable. At the same time, it must not lay more cables than are likely to be needed, as the current subscribers pay rates enough to cover the interest charges on unused capital investments built in anticipation of future needs.

While in the nature of things many of the findings of these surveys and the original data upon which they are based cannot be made public in their entirety, it is the policy of the companies to cooperate with city officials, chambers of commerce and other organizations working for community betterment. In many cases telephone engineers have served as members of city planning commissions, and their knowledge of present conditions and their vision of the future have proved invaluable.

San Jose a Close Second in the Use of Radio

The adoption of the radio telephone as a means of transmitting chamber of commerce messages appears to have been made almost simultaneously at widely different points in the United States. In the June issue of THE AMERICAN CITY appeared an article by Miss W. E. Bacon, Assistant Manager of the Albany, N. Y., Chamber of Commerce, describing the Albany meeting of April 12. On April 21 the Brooklyn, N. Y., Chamber of Commerce was addressed by radio; on April 24 the Pittsburgh, Pa., members were welcomed in Toledo by a radio talk broadcast from Fort Wayne, Ind., on April 26 occurred the radio talk from an airplane by Roy S. Smith of the Albany Chamber of Commerce, and on the same day Roscoe D. Wyatt, Manager of the San José, Calif., Chamber, broadcast from K. Q. W., Herold's Radio Laboratory at San José, a talk on "The Valley of Heart's Delight."

If other prior claims to use of radio for chamber of commerce purposes can be made, THE AMERICAN CITY will be glad to hear of them, but it seems, so far as the present evidence indicates, that Albany had a slight lead, with second honors almost equally divided between members of Brooklyn, Pittsburgh, and San José Chambers.

Promoting Water-Works in Small Towns and Villages

"A water-supply is of course the most important requisite in a community of any size."—Fraser Brown, Lecturer on Finance, New York University

THE average community is keenly alive to its development in population, industry and wealth, and early experiences the desire for a water-works. The circumstances that make the construction of a public water-supply advisable are as follows:

1. Safeguard to health
2. Protection from fire
3. Convenience of domestic water-supply
4. Necessity of industrial water-supply

The loss and damage by fire, the diseases arising from unsanitary drinking water, the inconveniences of a home which has no bathtub, the embarrassments and enormous danger connected with the disposal of human excreta, the unsightliness of barren yards, the trouble and labor in securing water from springs or wells, the handicap to factories on account of lack of water-supply—these are some of the conditions which demand that communities give consideration to the building of water-works.

Sanitation is perhaps the first and most important object of a community water-works, although, strange to say, the object that appeals most to the public mind usually is fire protection. The spectacular effect of a fire makes a deep impression upon the average individual. He cannot help but wonder when the same danger may threaten him, and his thoughts turn naturally to a water-works as the logical means of protection. As a matter of fact, however, there would be little need of fire protection if the modern town or city tried to exist long without proper means of sanitation. The valuable homes and factories for which men need fire protection depend first upon the health of the community. Without proper means of sanitation they would cease to exist.

The Fire Protection Value of Water-works

Through all history one of the great enemies of mankind has been fire. The National Board of Fire Underwriters rate a water-works as of more importance in fire protection than a fire department, for the reason that a water-supply may be of some use without a fire department, but a fire department without a water-supply is practically helpless in case of fire. The plan adopted by the National Board of Fire Underwriters in rating cities in regard to their fire protection facilities is similar to the method of marking a schoolboy's examination papers where so much is taken off for every mistake. The sum of the maximum points of deficiency totals 5,000 and is divided in accordance with the relative values of the features as follows:

	Points
Water-supply	1,700
Fire department	1,500
Fire alarm	550
Police	50
Building laws	200
Hazards	300
Structural conditions	700
	5,000

In a city where the fire defences and physical conditions are excellent, there would be few points of deficiency, and the rating of one where conditions are as bad as possible would approach 5,000 points. The water-supply is given a weight of about one-third of the total requirements. It is considered as being of slightly more importance than a fire department, as a water system is of value for fire protection where there is no organized fire department.

Industry Needs Water

The advantages of having a water-works are not confined by any means to its service in the home. Some towns remain small because of lack of foresight in attracting new business. Industry welcomes with open arms a public water system in a community; in fact, there can be no real industry without some kind of water-works system. Should a proposed factory be faced with the necessity of providing its own water, the chances of its locating in some other community where a public

water-supply system is in operation are very great. Wherever steam power, hydraulic power and similar factors are to be considered in an industrial plant, the question of water-supply becomes all-important.

Industry is not indifferent to sanitation. Where people congregate to work there must be provision for sanitation and health as there is in the home. In some respects the importance of sanitation in industry is greater than in the home because of the congregation of many people in a comparatively small space where uncleanliness and poor sanitation more easily develop. An epidemic of dysentry, according to an automobile concern in Michigan, resulted in a loss to the employees of $15,000 in wages and a loss to the company of $40,000.

Sometimes when the matter of improved health and lower death rate is brought up, citizens intimate that they are satisfied with their health records as they are. Many have used private wells and have never been sick from the water. But while they may not have had typhoid, they are always exposed to it. The man who makes a practice of racing trains to the railroad crossing often boasts that he has never been hit, but he usually "gets it" sooner or later. Many who suffer from the milder intestinal diseases seldom consider the fact that their water-supply was responsible. The argument that wells have been used for a number of years with no resulting typhoid, is not good. The chance of pollution is always present and it is not worth risking life on such a chance. Because a house has not burned down is no reason why the occupant should be careless with fire about the house. The same is true of typhoid and polluted springs and wells.

Arousing Interest in the Proposed Supply

It is an unfortunate fact that plans for public improvement frequently fail to materialize simply on account of public ignorance. Many cases can be cited where the great need of water-works was recognized by city officials and yet a proposed bond issue to pay for the improvements met with utter defeat at the polls. The remedy is public education. City officials, or whoever may be interested in the construction of water-works, literally must organize a sales campaign and sell the idea to the taxpayers. To successfully do this it is necessary that all the facts affecting the particular situation involved must be compiled, analyzed and digested and put in such form that their import can be grasped by the average citizen.

The first step is the employment of a competent consulting civil engineer. Experience has shown that it is most unwise for a small community to attempt a public improvement such as a water-works without the impartial and unprejudiced guidance of a consulting engineer. There are many engineers who make a profession of this kind of work, and no difficulty should be experienced in getting in touch with one of them.

A note of warning might be sounded here to insure that an engineer is employed who understands the principles of promotion. Cases are known where the preliminary reports of an engineer have been so technical and theoretical that neither the city officials nor the public were ever able to make head or tail out of them. What is desired is not a long technical report, but a digest of the salient facts which will appeal to the public. A water-works is a very human affair and should be so treated.

This information once accumulated, the campaign really gets under way. Some of the agencies commonly used are newspapers, public meetings, civic organizations, women's clubs, churches, business organizations, and the mail.

Newspaper Publicity and the Uses of Pictures

The local newspaper will usually be a willing and powerful factor in a campaign. The editor is generally a booster and he will be glad to publish all educational articles submitted to him on the new water-works. This is one of the first steps in arousing public interest. The next might be a mass meeting addressed by local business men who are familiar with the situation. Coincident with this development, the civic organizations, women's clubs, churches and business organizations should be interested and asked to take active part. At any time during the campaign, use may be made of the mail to carry messages direct to the homes of the voters. Experience has shown, however, that this "direct advertising," as it is called, can be best used as a clincher for a campaign.

An attractive leaflet can be printed at small cost as the campaign draws to a close and the date for the bond election approaches. This should be mailed direct to the home of the voter, where the interest already aroused will insure that he will study it.

It is probable that pictures, which constitute a universal language, will appeal to most of the voters. They are much more easily understood and have a greater appeal than text matter. Photographs of water-works in neighboring towns, compared with photographs in your local town showing local fire-traps, unhealthful accumulations of garbage, dangerous wells, and similar views can be used with enormous effect in the newspaper and on slides furnished to the local motion picture house. Health statistics of cities which have water-works and those which have not may also be gathered and compared, and a similar comparison of fire insurance rates appeals strongly to every one. Maps can be made of the proposed water lines and shown in the newspapers and motion picture shows.

The Clincher Booklet

Following is a series of questions and answers which may be used with some variations in the clincher booklet to be sent to the voter just before the bond election:

WHY VOTE "YES"?

The questions and answers given on the following pages have been prepared by the consulting engineers employed by the village, and these engineers personally guarantee correctness of the statements made. These are being distributed by the Council in an attempt to put before the voters the entire facts in the case, so that they may vote on the question intelligently.

1. Q. What kind of a proposed water-supply and distributing system is being planned for.....?

A. It is proposed to provide a drilled well or wells so cased off as to make almost impossible any contamination from surface water. The water will be taken from these wells, treated to make it safe for consumption, and placed into an elevated tank by means of a pump driven by electric motor or gas engine, and from this tank the water will be distributed under about 50 pounds pressure through the cast iron mains to be laid in practically all the streets in the town. On these cast iron mains will be placed between 30 and 35 fire hydrants, which will afford fire protection for practically every house and building in the village.

2. Q. Will this water be used for drinking purposes?

A. Yes. Each property owner will have the privilege of tapping or connecting into the cast iron main in the street in front of his property and thus secure running water for his kitchen and bathroom use, for use in sprinkling the lawn or garden, washing automobiles, etc., or for any other domestic use desired.

3. Q. How will each property owner be assessed to pay for the water which he may use on his premises?

A. Either by charging a flat rate to all consumers based on the number of hydrants or faucets which the property owner provides, or by each user's having a meter and paying so much per thousand gallons for all water passing through the meter. The plan of using meters is much preferred because when the property owner realizes that he pays only for so much water as he actually uses, he will be much less inclined to waste water than if he is paying a fixed sum regardless of how much he may use.

4. Q. What will it cost the average family per month or per year for the water used?

A. This will depend on the rate fixed by the Board of Public Affairs and may vary. .....(some neighboring town).....has a minimum meter rate of.... cents per month, which is equivalent to $.....per year. This is less than.....cents per day. Even if double this rate were charged here, it would amount to less than.....cents per day.

5. Q. How is it proposed to pay for the installation of a water system for———(name of town)———?

A. On .....(date of election)....., the voters of the village will have the opportunity to approve or authorize the issuing of $..... in bonds. The money secured by the sale of these bonds will be used to pay for the sinking of a well or wells, for the erection of a pump-house, for installing the necessary pumping machinery, and for providing an elevated storage tank. In addition to the items above, which will be of permanent service to the entire town, a portion of the proceeds of the bond issue will be used in paying for the water-mains across street intersections and for paying a portion of the cost of "tie lines" or "circulating lines" connecting the ends of parallel water-mains, which should not properly be entirely charged against the corner lots along which they will extend.

6. Q. Will this $..... cover the entire cost of the supply system and the mains through which the water is distributed?

A. No. It is planned to charge against each property in front of which the water line is laid an amount equal to one-half the cost of the 6-inch cast iron main; the other half, of course, to be charged against the property on the opposite side of the street. The amount charged against each abutting property owner can be paid for by the owner in ten or more installments. Assessment bonds will be issued to secure the money in anticipation of the collection of this assessment from the owner.

7. Q. What will this assessment amount to per front foot for a 6-inch main?

A. Approximately $..... per foot; that is, the owner of a 40-foot lot would be assessed $....., which he could pay $..... per year each year for ten years, with interest on the unpaid portion each year.

8. Q. How much would this interest average?

A. Approximately $.....; that is the total average cost per year on a 40-foot lot would be $.....

9. Q. Then the assessment against a man owning a 40-foot lot would amount to less than ....cents per day during ten years in which he was paying it off?

A. Yes.

10. Q. How will the money to pay off the $..... bonds be secured?

A. By an increased tax on each piece of property in the town.

11. Q. Can this increase be made and yet not increase the present tax of ....mills to more than ....mills?

A. Yes. The additional ....mills can be levied on the ..... and thus secure annually approximately $.....

12. Q. Will this amount, set aside each year, raise money enough to retire $..... in bonds at the end of .....years?

A. Yes, and as the value of property in ....(name of town).... increases, the ....mills levy can be decreased and yet raise each year the necessary amount of money.

13. Q. Is ——mills a high tax rate?

A. No. There are ten taxing districts in ....(local or neighboring county).... which had a higher rate in 1919. The highest was ....., which had a rate of ....mills.

14. Q. Is it true that this increase in taxes really means that each property owner will have that much additional expense each year?

A. No. Each property owner who has his buildings insured will benefit by a decreased fire insurance cost, which saving will go a long way toward paying his increase in taxes.

15. Q. How is it known that such a decrease in fire insurance cost will follow the installation of a water-works system?

A. Consult any fire insurance agent and he will tell

you that the rates for insurance in .....(name of town)..... are now fixed on the basis of .....being in Class..... as established by the .....Inspection Bureau. This same Bureau has stated to a committee from your Council that after the installation of a modern water-works system .....(name of town) .....will be placed either in Class..... or ....., and that the rates in Class..... or ..... will average approximately .....per cent less than the rates in Class .....

16. Q. What does this mean in dollars and cents on a residence property insured for $2,000?

A. On a 3-year policy it will mean a saving of $....

17. Q. What would the increased tax per year on a $3,000 property amount to?

A. $.....

18. Q. Then a man owning a 40-foot lot with house and lot valued at $3,000 and the house insured for $2,000 would have what additional expense put upon him by the installation of the water-works system?

A. His assessment for the water-main in front of his property would amount to less than .....cents per day, his increased taxes to pay off the $..... bond issue would amount to less than .....cents per day, and if he were using the water in his house, the cost of the water would amount to less than ..... cents per day. Thus, the entire cost to him for the installation of the system and the use of the water would be less than .....cents per day. The saving on his $2,000 worth of insurance would amount to a little over ..... cents per day, so that his net cost would be ..... a day for the remaining 15 years.

19. Q. Then for an amount less than the cost of a good cigar each day, it will be possible to secure a first-class water-supply and distribution system for ..... (name of town) ..... and also pay for the use of the water?

A. Yes.

20. Q. Briefly then, why am I going to vote "Yes" on the proposed bond issue .....(date of election .....)?

A. (1) Better fire protection will be given each one in town, which may mean the saving of my own home as well as that of many of my neighbors, should a serious fire be started.

(2) It will be possible to use a sanitary sewer system should the same be installed now or later.

(3) .....(name of town).....will be made a more healthful, and, therefore, a much more desirable place to live. With running water under pressure available for each house in town, values of all property will be increased. .....(name of town)..... will be a bigger and better and more prosperous town the year around.

(4) Finally, I have as much pride in my town as have the people living in other towns which have already built a modern water-works system. I am willing to do as much for it as anyone in the town, therefore I expect to vote "YES."

This report prepared, published and circulated by:

.....

(Give name of consulting engineers,

.....

City Council, Mayor or similar au-

.....

thority.)

It is to be understood that most of the statements contained in these questions and answers are assumed as applying to an imaginary case, but many of them need only be changed slightly to meet local conditions, or other questions of a somewhat similar nature may be substituted.

With the bonds sold and the money in hand, the consulting engineer is recalled to the work, and the actual construction of the water-works is ready to begin. It is the consulting engineer's work to draft detailed plans and specifications for every phase of the proposed construction. Then bids are secured from contractors and the construction of a public water-supply is soon under way.

Acknowledgment.—Published through the courtesy of the American Cast Iron Pipe Company.

Schoolhouse Fire Hazards

Heating Apparatus, Defective Electric Wiring and Bad Flues Most Prolific Causes of School House Fires

THE majority of school fires are due to the heating apparatus. In the country schools heating-stove fires are frequently started by coals falling from the open doors after the teachers and pupils have gone. In the larger cities, where regular janitors are employed, the losses due to the heating hazard are less, but in the smaller places, where the work of the janitors is incidental, they fire up but once or twice a day, and the blazes start in their absence. Defective electric wiring and poor housekeeping are also prolific sources of schoolhouse fires, and the increased use of soft coal because of the fuel shortage, and of inferior grades of such coal, has led to many defective flue and sparks-on-shingle-roof fires.

Improved construction, better housekeeping and careful inspections are the principal remedies for these deplorable conditions. A tabulation of losses shows that the experience has been better in Ohio than in any of the other states considered. This is attributed to the superior building laws of that state relating to schoolhouses, which were enacted after the burning of the Collingwood school, in which nearly 150 children lost their lives. Ohio requires that all school buildings more than one story high must be of fire-proof construction, and the fire prevention regulations are strictly enforced by the State Fire Marshal, who also makes specially careful inspections of schoolhouse risks. Other states and municipalities should not wait until they have a similar holocaust before safeguarding the lives of their children.

The Anti-Litter Movement in America

By W. S. McGrane

Manager, Anti-Litter Bureau, Merchants' Association, New York, N. Y.

ALMOST every city and town in the Union has within the last few years had its attention called to the fact that clean-up work was necessary. For the most part, the thought has been crystallized into a spasmodic attempt usually put into force each spring and known under the title of Clean-up Week, Fire Prevention Week, etc.

Little or no cognizance has been taken of the fact that immediately after such spasmodic attempts, conditions often become actually worse than before. And yet every municipality is satisfied apparently to spend hundreds, perhaps thousands, of dollars each spring to make the town clean for one week, when for a smaller expenditure it could establish a permanent Anti-Litter Bureau operating under the chamber of commerce or board of trade to keep the town clean for the whole year.

A competent manager and a stenographer with quarters in the meeting room of the Chamber of Commerce are the only force required. The work is best divided into two classes—educational, and inspectional and report. In the former the manager enlists block captains from among the students studying civics in the high schools. These students report to the Bureau cases of violations of ordinances which they cannot of themselves correct. The Bureau acts as a clearing-house for the complaints and forwards the reports to the particular city department involved. In the latter case the manager himself makes inspections, correcting conditions wherever he can, or forwarding the complaints through his office. The Boy Scouts and civic organizations of the town should likewise be interested to report, regular testimonials being given for good work, and meetings arranged for general discussion of individual problems.

The nature of the complaints will vary according to the size, character of development of the town, number and nationality of the citizens, etc. In the big town we shall find that uncovered garbage cans,

UNSIGHTLY LOTS LIKE THIS BEHIND BILL-BOARDS FURNISH ARGUMENTS FOR ANTI-LITTER CRUSADERS

IT IS HARD TO HAVE REAL CIVIC SPIRIT ON THE SAME STREET WITH THIS

street litter, littered fire escapes, dead animals in the street, exposed foodstuffs, expectorating on the sidewalk, etc., are among the more common violations. In the small town broken guard-rail fences, unmuzzled dogs, overflowing cesspools, etc., may be the principal violations. In fact, every city and town will have its own individual problems and probably no two will be alike.

The problem involves the study of the city, its inhabitants and their habits. Often the chamber of commerce is not in harmony with the city administration. Great care should therefore be exercised to "sell" the city officials on the ground that the Anti-Litter Bureau is trying to help them and that a mutually cooperative spirit is best for all concerned.

The manager should use a great deal of discretion before forwarding complaints and should be absolutely sure of his ground. He must not criticize or find fault, but at the same time should be tactfully insistent. No more harm can be done a good cause than by over-enthusiasm, and it must be remembered that in this work, more than in any other, human inertia and indifference must be fought and conquered, and without causing friction.

The city or town that can afford the services of a competent and trained manager to do this work will find that sooner or later a gradual change will be felt. It will be slow, up-hill work, and will require diligent application night and day. It is only a matter of time, however, when the slogan "Every day must be clean-up day" will be crystallized into action and the useless clean-up week eliminated. When that time comes, we can eliminate litter.

Kentucky Adopts City Planning Law

When the Governor affixed his signature to the city planning bill, Kentucky stepped into the column of states having real city planning laws. The new act affects Louisville, the only first-class city in the state, and the second-class cities of Lexington, Newport, and Paducah. It provides for a planning commission in each city to have charge of systematic physical development and to prepare a survey of the city with the necessary maps. All future improvements in the way of cutting through streets and alleys, and all additions to the city, must thereafter conform to the plans adopted by the commission.

All persons who are engaged in laying out additions or opening up new streets may appeal from the commission to the circuit court, but excepting in cases where courts have for cause overruled the determination of the commission, the county clerk may not receive for filing of record any plats that do not conform to the commission's maps.

Detroit and Grand Rapids Working for Better County Government

By William P. Lovett
Secretary, Detroit Citizens League

UNDAUNTED by the failure to secure by July 1 the 105,000 signatures to the petition to put on a state-wide ballot a constitutional amendment permitting commission government by counties in Michigan, the progressive citizens of the two big counties, Wayne and Kent, which contain the cities of Detroit and Grand Rapids, are planning to go ahead with their own program based on the proposed amendment.

The latter was the result of two years of study and work by a Citizens State Committee which tried to get the question submitted a year ago by the State Legislature; it passed the Senate, but was then smothered by county politicians in the House.

In brief, it provided that any county whose people cast a majority vote for it might adopt a commission plan of county government, with three to nine commissioners, elected at large or by districts, who were to discharge all administrative functions, and who were to appoint all other county officers. The amendment would have made no change in taxation or the judiciary, but would have enforced the board-of-control principle, leaving county supervisors nothing to do but to equalize taxes and attend to township or other local duties.

The Wayne County Committee will soon meet to decide upon the future program for Wayne County. It is assumed that the constitutional amendment, permitting relief for Detroit and Wayne County by substituting a board of control such as exists in the city of Detroit, for the impossible board of 97 county supervisors, will again be presented. It is also recognized that the failure of the petition campaign in the state furnishes a turning-point at which new ideas, from all possible sources, will be invited. Several representative Detroit citizens who have helped the state program, because it would give relief, in time, for Detroit, are ready with new proposals, calculated to solve the problem for this growing city.

The supervisor system in Michigan counties has been carried to such an extreme that Wayne County, with Detroit, has 97 supervisors. It follows that the real business is done through subcommittees, while the control of the system is usually taken over by a few politicians who are accountable, not to the people, but to other politicians.

Many counties also have auditors, three in number, who form a third area of political operations, but who likewise play the good old game of "passing the buck." In addition, there are seven constitutional offices filled by direct popular election. Thus, with three or four areas of separate power, it is impossible to fix responsibility, and "government by suspicion" is the rule.

Naturally the evils of the old system show up most glaringly in urban counties, where modern city charters are inevitably in vivid contrast with the ancient methods of county government. Michigan has 30 or more commission and general-manager city charters in full operation, so it is natural that demands for simple, centralized control of government should be heard in the counties.

While proponents of the new idea urge efficiency, economy, and more direct popular control, to be secured by the commission plan, the opposition plead for "the rights of the people" at the polls, said rights being in peril, of course, unless the people—which means actually the politicians—have just as many elections and just as many elective offices to be filled as possible. It is a case of the autocracy of the politicians against the democracy of the short ballot, direct popular control, and clear accountability on the part of all officials.

In its campaign, the State Committee found its greatest obstacle in public ignorance of county government, plus indifference to any real reform. This condition gives the petty politicians their chance to oppose any change in system. But the committee has mapped out a five-year program and will stick to it.

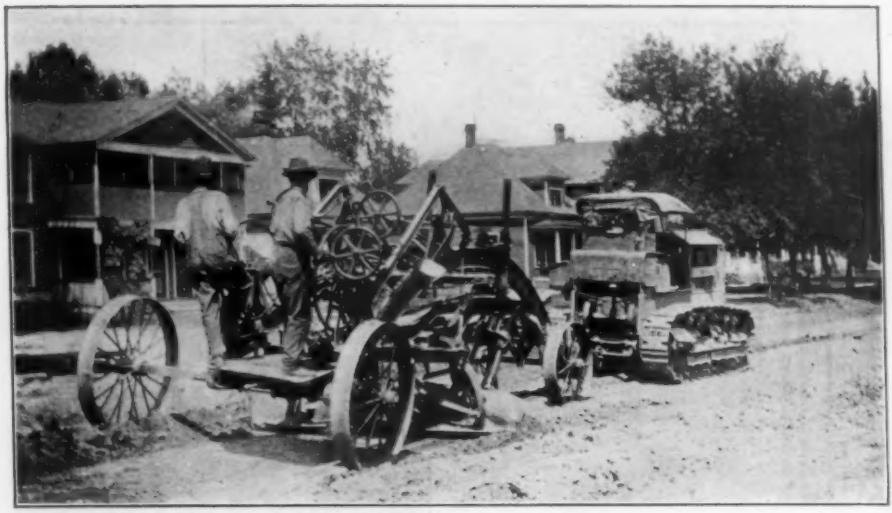
Good Streets, Clean Streets, and Public Safety Through Motorization

FIRE APPARATUS AT WORK? NO, A MOTOR FLUSHER HELPING OUT

The "South Bend" flusher, which can just be seen in the picture, was working seven blocks from the scene of this fire in Washington, N. C., when the alarm sounded. It arrived at the fire before the regular apparatus and had the first stream playing on the blaze

A PACKARD-NORTHERN 750-GALLON, TRIPLE COMBINATION IN SERVICE AT WILMINGTON, N. C.

The chassis of this machine is a standard twin-six Packard. The equipment consists of a Northern combination chemical and hose outfit and a 750-gallon pump. The machine can attain a road speed of 70 miles an hour, and in its 12-hour Underwriters' test handled 750 gallons at the standard pumping pressure of 120 pounds

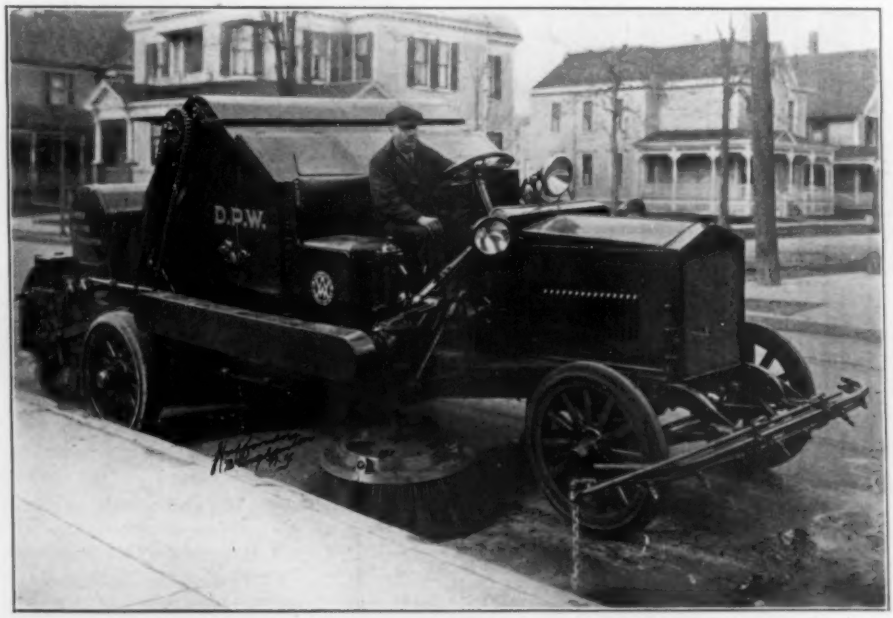


THE CITY OF COLORADO SPRINGS, COLO., USES ITS HOLT TRACTOR AND AUSTIN-WESTERN GRADER FOR MAINTAINING ITS ROADS

Photograph furnished through the courtesy of Frank O. Ray, City Engineer, Colorado Springs

Two Seconds to Avoid Mishaps

No country road should be made with curves that do not permit vision 200 feet ahead, because two cars approaching in opposite directions at 30 miles an hour will meet within two seconds after they are 200 feet from each other.—A. R. Hirst, State Highway Engineer, Madison, Wis.



AN AUSTIN-WESTERN PICK-UP SWEEPER WITH GUTTER ATTACHMENT, USED BY THE DEPARTMENT OF PUBLIC WORKS, BINGHAMTON, N. Y., FOR KEEPING IMPROVED PAVEMENTS CLEAN

Chamber of Commerce Activities in Public Affairs

The Friendly Town of Mitchell

MITCHELL, S. DAK.—Mitchell's new tourist camp shelter is one of the best buildings of its kind in the Northwest and is rapidly giving Mitchell the reputation of a friendly town. On all roads approaching the town, a little white arrow points the way to the camp.

Previous to this year, a tourist camp with ordinary accommodation was provided for tourist travelers. So well patronized was the camp, so appreciative were the tourists, and so beneficial to trade was the camp, that the Mitchell Chamber of Commerce last fall took the initiative in promoting the erection of a real tourist shelter. Accordingly, the camp building was erected during the winter months, at a cost of $3,200.

The equipment of the new camp provides without charge all the comforts as well as the needs of the tourist. The building is lighted by electricity and furnished with gas stoves. Shower-baths and laundry are available to all who will use them. Tables and chairs are provided in case the weather is too unpleasant for outdoor meals.

In addition to all this mechanical equipment, the human element of friendliness appears in the form of police protection to work against theft from cars and tents, and in the form of "greeters' committees." Every day some one is available constantly to meet the visitors and to help them in every way possible. The members of the Kiwanis, Rotary, and Lions Clubs divide this work among themselves in such a way that no one person's work and time suffer interruption seriously.

The Good Roads Committee of the Chamber of Commerce is in charge of the camp, and for its conduct has formulated the following regulations:

"The camp ground shall be open to all tourists.

"The use of the tourist shelter, except toilet facilities, shall be limited to tourists only.

TOURIST CAMP SHELTER, MITCHELL, S. DAK.

"No tourist shall be permitted to camp therein for a period longer than five consecutive days.

"No tourist shall be permitted to remain in the camp while suffering from an infectious or contagious disease.

"No minors under the age of 16 shall be permitted to use the camp grounds unless accompanied by their parents, guardian, or proper chaperon."

New High School for Scottsbluff

SCOTTSBLUFF, NEBR.—A $300,000 high school is assured Scottsbluff as the direct result of an educational campaign and bond election sponsored by the Chamber of Commerce. Public opinion was very much against the voting of these bonds at the time, but the Chamber's educational campaign succeeded in turning the tide of sentiment, with the result that the issue carried two to one at the polls.

The Chamber also undertook to raise $50,000 in pledges to cooperate with the Methodist Hospital Board in purchasing and completing an unfinished six-story building to be equipped as a hospital. The Hospital Board is giving $100,000 in addition, and Scottsbluff will shortly have a first-class hospital, something it has long needed.

HESTER RUCKMAN,
Secretary, Scottsbluff Chamber of Commerce.

Milwaukee Embarks on Street-Widening Program

MILWAUKEE, WIS.—The approval of a bond issue of $2,500,000 on April 4 assures the opening of a much-needed large artery to carry the growing traffic through the heart of Milwaukee.

The $2,500,000 is to be used for the widening of Cedar-Biddle Street, beginning at Prospect and Juneau Avenues and ending at Grand Avenue and Ninth Street and State and Ninth Streets. It is planned to widen the street to 160 feet from lot line to lot line, including in this both roadway and sidewalks. Cedar Street will be widened to the south and Biddle Street to the north, and a bridge spanning the river will connect the two streets, making a continuous highway from the civic center to the lake, with connections at the lake end to Prospect Avenue, and at the upper end, at the civic center, to Grand Avenue and State Street.

The procedure known as excess condemnation, authorized by an amendment of the state constitution in 1912, will be employed in the proposed street widening, for the first time in Wisconsin. The improvement of Cedar-Biddle Street will greatly enhance the values of abutting property, and as the city is responsible for this increase in values, it will avail itself of the increased values it has produced, to finance the project itself. Excess condemnation enables the city to accomplish this. Land in excess of the absolute requirements for street widening to the south of Cedar Street and the north of Biddle Street will be condemned and, when the street widening has been completed and the improvements put in, the excess land, then abutting the widened and completed highway and greatly enhanced in value, will be resold. A detailed and intensive study has been made of the finances involved, and reveals that the cost of this whole magnificent project can be met by the sale of the excess land and by the assessment of benefits to property in the adjoining area.

Citizens and officials who have been striving for the principle of the orderly physical development of Milwaukee have cause to be encouraged. But the task is only just begun. The utmost caution is necessary that it may progress properly. This is a matter of far-reaching importance and one in which the civic forces are showing their continued interest by constructive criticism and active support.

LEO TIEFENTHALER,
Civic Secretary, The City Club of Milwaukee.

Six Bond Issues Carried by Chamber

LONG BEACH, CALIF.—Bond issues totaling $725,000 were carried at an election, April 18, through the educational work of the Long Beach Chamber. This money will be expended for the following civic improvements:

A public hospital, to be erected at a cost of $100,0000

Public comfort stations in various parts of the city, $50,000

A sewage disposal plant, to cost $100,000

A garbage incinerator and disposal plant, to cost $125,000

A fire alarm system and station houses and fire-fighting equipment, to cost $150,000

A new city hall, to cost $200,000.

LYNN W. BALLARD,
Secretary, Long Beach Chamber of Commerce.

Financing Secondary Roads

QUINCY, ILL.—An effective road-building campaign was recently inaugurated by the Quincy Chamber of Commerce for the construction and repair of gravel lateral roads to connect with the state roads. As part of the preliminary publicity, wide distribution was given to a small sheet containing on the front drawings of four different types of roads, and on the back the specifications for the first type, which was designated as the Chamber of Commerce type. The method of financing was as follows:

The county agreed to grade the roads and put in the necessary permanent bridges. The farmers living within a half-mile on each side contributed 80 cents per acre of their holdings, either in money or in hauling. The farmers living more than a half-mile and not more than a mile away contributed 60 cents per acre in money or hauling; the farmers living more than a mile and not more than a mile and a half from the road, 40 cents per acre; the city individual contributed from $1 to $10 per mile, up to 50 miles per year. This provided funds for 1,000 or more loads of gravel per mile, and brought in immediately enough money for 50 miles of gravel roads, which will be completed, it is hoped, this year.

CHARLES D. CENTER,
Secretary, Chamber of Commerce.

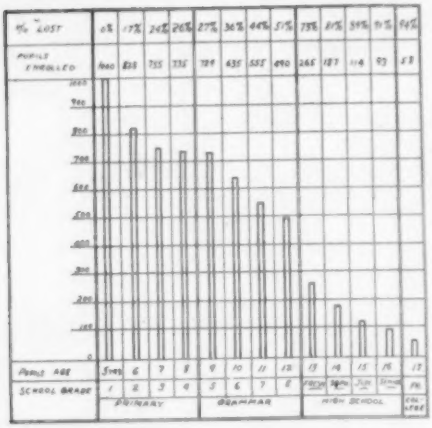


CHART SHOWING NUMBER OF PUPILS PER THOUSAND ENROLLED AT AGE 5 WHO REMAIN IN THE NEWARK SCHOOLS EACH YEAR

Newark's Back-to-School Campaign

NEWARK, N. J.—After a study of the school enrollment in Newark it was found that out of every thousand boys entering grade schools there was a 73 per cent loss from the grade schools and that 91 per cent dropped out before going to college. These figures were ascertained by consulting official school enrollment records.

The Boys' Work Committee of the Newark Rotary Club realized that the loss of 73 per cent ought to be stopped, and this was the cause of the Back-to-School Campaign.

There were 1,740 boys who graduated from the elementary schools in our city last year; 1,327 of them entered high school. The 413 boys who dropped out are the ones we are most interested in, and the Rotary Club therefore worked out a program to induce them to continue their education.

The plan adopted was to send a personal letter to each boy graduate of the grade schools, explaining why the Club was anxious for him to continue to gain more education. Enclosed in this letter was a postal card asking his intention and whether he would like to be interviewed by a Rotarian. The result was that over 200 boys responded, requesting interviews with a business man to help solve the individual problem regarding further education. The outcome of the interviews has been most encouraging.

A number of boys who could not see their way clear to further education because their parents could not afford it, were placed in positions for after-school and Saturday work. Boys who had thought of taking a business course for two years or a general course, after being interviewed by a Rotarian changed their plans and decided to finish high school. Those who were anxious to go to college and could not afford it, were shown how they could work their way through.

Teachers in the schools have been made to realize that busy business men are interested in the educational welfare of the boys of Newark. Parents of boys from foreign homes have been given a different view of the value of education.

The plan was simple, and the cost less than $50. In brief, the plan was as follows:

1. The personal letter and card were sent.
2. As the replies were received, showing those who were not going to high school, a special letter was sent urging them to reconsider and to interview one of the Rotarians.
3. The boys who requested interviews were assigned to Rotarians, and a report of each interview was handed in. At the completion of the first interview, many of the boys asked to be interviewed later, and others have been corresponding with the assignee.
4. Previous to the campaign, many firms with representatives in Rotary donated advertising space to give us an opportunity to tell our story to the parents and public as well as to the boys. These advertisements brought replies from parents and many boys from Newark and vicinity.

A plan is now under consideration to duplicate this campaign this fall, and also to have prominent business men of our city write letters to the school clerks, explaining in a brief way why they believe in an education at least through high school. This file of letters will be placed in the hands of the graduating boys and girls during the last two months of the school term, so that it may be read over by them, with the idea that the letters are to help them decide to continue from the elementary school through the secondary school grades.

Another added feature in the campaign will be the supplying of speakers on various professions and vocations for the different elementary schools. A question box will

be placed in the principal's office, where boys or girls who are interested in particular vocations can make a request for a personal interview with a business man or woman who is engaged in the vocation in question. Such interviews, we believe, will bring out the requirements for an education, the cost, and what is expected in the particular line of business when the education has been completed.

ROBERT K. HANSON,
Metropolitan Boys' Work Executive, Rotary Club, Newark, N. J.

Arkansas City's Landing Field Now Municipal

ARKANSAS CITY, KANS.—The Chamber of Commerce of Arkansas City believes that commercial traffic through the air is certain to be an accepted method of transportation. The only thing lacking is the development of landing fields in sufficient numbers to assure the pilot of a place to land when he desires or when necessity compels a landing. If municipalities can be aroused to the importance of the development and maintenance of landing fields with necessary equipment to give service, air navigation will go forward with great strides.

Believing this, the Arkansas City Chamber of Commerce began in 1919 to consider the question of a landing field for Arkansas City. An excellent location was found on a hill north of the city, and a lease was obtained by the Chamber of Commerce and the Williams-Hill Aeroplane Company giving that company the commercial rights of the field, with the obligation on their part to use their planes to advertise the fact that the field existed. On each of their three planes was painted, "Williams-Hill Aeroplane Company operating from the Arkansas City, Kansas, landing field. Established and maintained by the Arkansas City Chamber of Commerce."

This company in 1920 put out a flying circus which exhibited in approximately one hundred different cities before thousands of people. In December of 1920 a big air frolic was staged on this field, which attracted sixteen commercial planes from five states, Texas, Oklahoma, Missouri, Nebraska, and Kansas; ten army planes also came to the frolic as guests of the Chamber of Commerce. Thousands of people from miles away drove to Arkansas City to observe this frolic, the first of its kind in the Middle West. During 1921 the Williams-Hill Aeroplane Company promoted a great many air frolics in Kansas and Oklahoma, which further identified this landing field.

The result of eighteen months of such special activities was that Arkansas City became known far and wide as an aviation center. Planes traveling across the country made it a point to come by way of Arkansas City, where gas, oil, and service were available.

But, best of all, it convinced the business interests of Arkansas City of the value of a landing field, and a demand grew that the city authorities take over the control of this field, making it strictly a municipal project. As a result of this demand, a bill was prepared by Arkansas City business interests and presented to the State Legislature of 1921 making it legal for a city government to levy a tax for the purpose of maintaining a municipal landing field. This bill became a law, and the field here is now the Arkansas City Municipal Landing Field under the direct control of the City Commission, with the Finance Commissioner as superintendent of the field.

In April, 1921, a fund of $4,300 was raised to erect a hangar and repair shop on this field. The hangar was of wood construction and capable of housing ten planes. It was unfortunately destroyed by fire in less than thirty days after completion, with the loss not only of the building but of five planes and much repair equipment. This misfortune proved the unfitness of wood construction. A movement is now on foot to provide a steel hangar, or hangars, and workshop.

Recently an occasion arose wherein a consultation on an extremely vital surgical case was necessary and a noted surgeon in Wichita, Kans., was called into this consultation. This man entered a plane at Wichita and 35 minutes later entered an automobile which was waiting for him on the landing field at Arkansas City. The distance is 50 miles as the crow flies. As he entered the plane at Wichita he asked the pilot if he knew a safe place to land in Arkansas City, and the pilot replied that there was no need for worry for "there is a municipal landing field there."

This surgeon uses a plane for such oc-

There Is No Substitute for "Caterpillar"* Experience

The "Caterpillar's" field of usefulness is by no means limited to road making. There is a Caterpillar"* of size and capacity for every power need. On farm or ranch, in the mining, oil and lumber industries, for snow removal and other civic work—wherever power and endurance are at a premium, the "Caterpillar"* has no real competitor.*

Holt has pioneered in building tractors for many years. Our engineers have kept in close contact with the conditions encountered by highway officials and contractors on their road making, dirt moving and hauling jobs in every part of the world. This first-hand engineering experience, combined with our unequaled production facilities, has made the "Caterpillar"* the standard tractor the world over. "Caterpillars"* will master the toughest going and operate continuously and profitably where no other method or machine can work at all. Their power and endurance means that the job will be done in less time, with fewer men, and at the lowest cost. Other tractors, even some that superficially look like the "Caterpillar,"* may be bought at a lower price but experienced users will tell you that on the basis of cost per horse-power per year the "Caterpillar"* is actually the *cheapest buy on the market.* Send for a copy of our booklet, "Caterpillar Performance."

** There is but one "Caterpillar"—Holt builds it. The name was originated by this Company, and is our exclusive trade-mark registered in the U. S. Patent Office and in practically every country of the world.*

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casions on the average of once a week, and he made the statement that there were dozens of business men in Wichita who would make use of planes for transportation within a radius of 500 miles if they knew that the pilot would be able to find a landing field, marked, on which he could be assured of a safe landing, but that it was too hazardous to have to pick out a pasture or alfalfa field in which to land.

To further identify the city from the air, we are placing the name of the town on the largest roof we can find in the city, located near the railroad. This sign will be in white on a black background in letters 12 feet across, in order that it may be conveniently read by a pilot in the air at 1,000 feet.

It is difficult to convince communities that the question of transportation by air is no longer an experiment and that it will surely be of commercial importance. They fail to realize that the one big, outstanding obstacle to rapid progress is the lack of landing fields in sufficient numbers and quality to insure safe landing and necessary service. Not until municipalities begin to realize this truth and develop landing fields will private money begin to interest itself in transporation by air.

O. B. SEYSTER,
Secretary, Chamber of Commerce.

Educating the Public on Traffic Rules

SOUTH BEND, IND.—The South Bend Chamber is actively at work making the motoring public acquainted with the new city parking ordinance. Two policemen on full time have been assigned to enforce the ordinance, but obviously cannot reach all the motorists within a reasonable time. So the Chamber of Commerce, which is supporting the ordinance, has been furnishing, through the Boy Scout Council, a group of boys each day after school and all day Saturday to devote their time to explaining to automobile drivers the correct and incorrect methods of parking. These boys furnish each driver with a copy of the ordinance and, if he has been guilty of violating any part of it, a card on which the violation has been checked. If the owner is not in evidence, the card is placed on the car, with a copy of the ordinance attached.

The Police Department has expressed its appreciation of the work that has been done by the Chamber through the boys, and the Chamber in its turn is satisfied that the more strictly the ordinance is enforced, the more satisfaction it will create. Already the plan is working out very satisfactorily.

FRANK J. GREEN,
Manager, Chamber of Commerce

You are violating the Parking Law of the City

See the reverse side of this card. The rule which you have violated is marked X.

Your number has been taken and a record of the violation has been made.

***The Police Department* respectfully asks that you learn and obey all *Traffic Laws*.**

- ☐ 1. Your car was parked here more than one hour.
- ☐ 2. You did not park at an angle of 45 degrees with the curb.
- ☐ 3. You did not park parallel with the curb and within 2 feet of the curb.
- ☐ 4. You parked within 15 feet of a fire hydrant.
- ☐ 5. You parked within 25 feet of a Safety Zone.
- ☐ 6. You parked your car with its left side next to curb.
- ☐ 7. You parked your car farther than 2 feet from the cars nearest to it.
- ☐ 8. Please call at Police Station.

TRAFFIC VIOLATION CARD USED IN EDUCATING DRIVERS IN SOUTH BEND

Consider Well the Question of Health

The public drinking cup is forbidden by law in many states—because it is a menace to the public health.

MUELLER Sanitary Drinking Fountains

comply with the law—insure freedom from contagion—are absolutely sanitary and hygienic—are practically fool-proof and require no attention.

No. E-3705 here shown is one of many models—in both Wall and Pedestal patterns—all of the bubbling type—all of MUELLER standard construction.

Descriptions and prices on request.

H. MUELLER MFG. COMPANY, DECATUR, ILL. PHONE BELL 153

Water, Plumbing and Gas Brass Goods and Tools

New York City, 145 W. 30th St., Phone Watkins 8397 San Francisco, 635 Mission St., Phone Sutter 357
Sarnia, Ontario, Canada

Mueller Metals Co., Port Huron, Mich., Makers of "Red Tip" Brass Rod; Brass and Copper Tubing; Forgings and Castings in Brass, Bronze and Aluminum; Die Castings in White Metal and Aluminum; also Screw Machined Products.

Omaha Volunteer Traffic Officers Prove Valuable

OMAHA, NEBR.—Two thousand arrests and fines that range from $1 to $500, and a 50 per cent reduction in automobile accidents, is the record made by Omaha's volunteer traffic officers during the past two years.

Omaha organized her citizen constabulary in 1920. In a short time 240 business men were "sworn in." These men were given the title of "Volunteer Civilian Officers" and were subject to the call of their superior officers. As this group was too unwieldy to handle with efficiency, in 1921 the organization was reduced to 180, commanded by 8 captains under the direct supervision of the Chief of Police of the Omaha Police Department.

The Omaha Chamber of Commerce meanwhile had incorporated within its organization a Traffic Safety Committee with a paid secretary devoting his full time to this movement. The citizen cops were given intensive instruction in the state laws and city ordinance regulating automotive traffic. They were called only when needed, and special 'drives" against violators were put on at intervals. Chief M. F. Dempsey took citizen cops individually and gave them private instructions in various policing systems. In selecting the officers, reliability, honesty, character and diplomatic ability were considered in each candidate.

The "golden rule" summons has proved successful in Omaha and has done much to expedite the work of the Police Judge. When a violator is hailed to the curb by a volunteer officer or a city policeman, he is handed the original of the summons and is told to report in police court to answer charges on a specified day. The officer retains a duplicate of the summons, from which the court record is made. The violator, unless he has done something very criminal or negligent, is allowed to proceed. The summons is very rarely disregarded, and when it is, a warrant for the immediate arrest of the violator is issued.

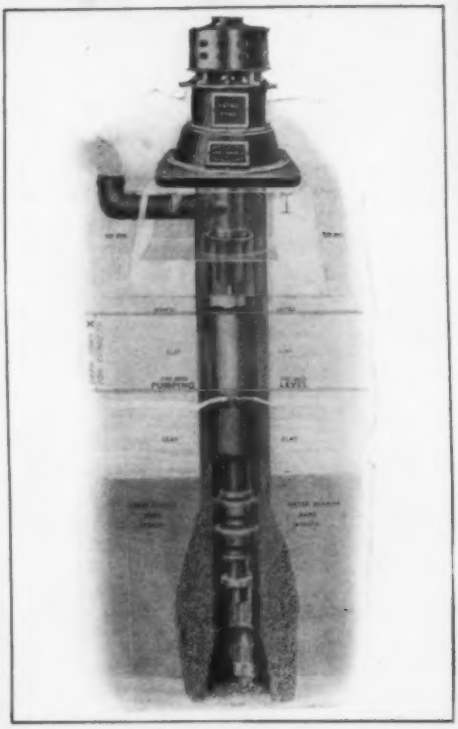
The function of a corps of volunteer officers coming from civilian ranks must necessarily confine its activities to work along educational lines. With that thought in mind, a program of educational work in the public and parochial schools of Omaha was undertaken by the Traffic Safety Committee of the Omaha Chamber of Commerce. The Superintendent of Education was furnished by this committee with object lessons and talks, which he sent out weekly to the various school principals, who in turn passed them on to the grade teachers. These lessons contained an element of play which tended to interest the pupil in the proposition. Schools bordering on busy thoroughfares were asked to appoint a corps of boys, preferably those experienced in Boy Scout work, to act as traffic officers in the morning before school, during the lunch hour and after school. These boys were stationed in the streets at intersections near the school and were furnished with blanks supplied by the Traffic Safety Committee containing a list of various common offenses, such as speeding by the school, noisy cut-out, etc. The boys were instructed to take the numbers of cars thus violating the laws and then turn them in to the Secretary of the Committee. The owners of cars were located by the numbers, and letters were written them from the Chamber of Commerce office stating the facts and asking their cooperation in eliminating accidents to school children by observing the ordinances. In no case is the schoolboy officer allowed to issue summons. After a person has been reported three times, he is called by phone and warned that the next offense will bring an arrest.

Educational work was further carried on by means of motion pictures in the theaters. The theaters situated in the residence sections of the city where the greater number of pedestrians live were the most efficacious.

The newspapers of Omaha are assisting the Police Department and the Traffic Safety Committee. Speakers are sent out from time to time to various civic organizations, calling attention to the old laws, and to the new laws as they are put into effect.

The corps of volunteer traffic officers are called together by order of the Police Chief once each week. They meet at the central police station and are assigned to various stations throughout the city where automobile traffic is dense. For instance, one week is given to the matter of lights under a recent Nebraska state law regard-

Layne Vertical Turbine Pumps for Deep Well Pumping



The remarkable savings over other types of well-pumping installations are due to the much greater water separating area exposed to the waterbearing formation by our large diameter wells, which is increased to still greater effective diameter by surrounding it with gravel. The gravel permits much more rapid water percolation to the wells than the original water-bearing strata. It acts as a filter, permitting large volumes of water to flow into the well and at the same time effectively restraining the sand.

The Layne scientifically constructed well screen with its much greater area of perforations than is secured with ordinary perforated casings, permits large volumes of water to pass to the inside of the well with very little resistance, which means a minimum pumping head in the well. That is why it is possible with a Layne gravel-wall well to pump twice as much water from a given water stratum and to maintain a smaller pumping head than in an ordinary well delivering one-half the water.

Layne scientific methods of water well construction and development of water from subterranean sources are the result of 35 years of constant improvement on the old haphazard and unscientific methods of drilling water wells. We can truthfully say that we are the only company in the world today that has applied the same intelligent efforts to improve methods of underground water development that have been applied to other processes, seeking to develop natures forces and assets.

Illustrated literature on guaranteed Water Supplies and Layne Vertical Turbine Pumps will be sent free on request.

LAYNE & BOWLER COMPANY
MEMPHIS TENNESSEE

ing the proper focusing of lights and the lighting equipment of automobiles. The officers are instructed to issue summons to every driver whose lights do not meet the specifications of this law, or who is running the car with only one headlight, no tail-light, or no lights at all.

On night work, four or five men are sent to one location and scattered over a distance of two blocks. These men are equipped with search-lights, and they flash signals from one officer to another as the cars pass them without tail-lights. The cars are drawn in to the curb and, when possible, the drivers are given an opportunity to adjust their lights in conformity with the law. In other cases they are issued summons to appear in Police Court at a stated time, and are there fined according to provisions of the law.

On December 6, 1921, a packing-house strike necessitated the sending of every available police officer to the packing-houses. The Chamber of Commerce volunteer traffic officers were called upon for traffic duty at busy street intersections. Within twenty minutes after the call was sent to the Secretary, seventeen volunteer officers had taken their places on street corners. Working in two shifts each day, these volunteers directed all street traffic for a period of six weeks without a cent of expense to the city. Traffic moved as usual, without a single accident.

The Police Department, in conjunction with the Traffic Safety Committee, has sent letters to all concerns employing paid drivers, asking their cooperation in this movement, and all concerns operating automobiles are insistent that their drivers use every precaution in handling their cars.

A statement by the Omaha Chief of Police follows:

"The distressing loss of life and economic loss that is sustained through the operation of automobiles must follow its natural evolution, but I believe that through awakening the citizens to their own responsibility we have accomplished a great deal by handling this matter, not as a sporadic attempt, but as a continuous drive towards the education of automobile drivers."

MONTAGUE A. TANCOCK,
Manager, Bureau of Publicity, Omaha Chamber of Commerce.

CITIZEN TRAFFIC COP AT WORK, OMAHA, NEBR.

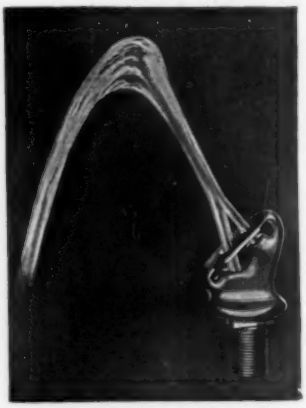
Tax Inequalities Exposed by Chamber

ESCANABA, MICH.—The Chamber of Commerce is engaged in a campaign to secure for Escanaba a fairer proportion of the benefits from the heavy tax assessment levied against this city on account of the great value of the local railroad property, which is approximately equal to the total assessed valuation of the entire city. The Chamber has made a thorough investigation of the matter, and can show that the state of Michigan profits yearly at the expense of Escanaba to the extent of over $9 per capita.

The Chamber takes the position that a large portion of the income derived from the tax on railroad property in Escanaba should go to help share the burden imposed upon the city in providing education, police and fire protection, and public service facilities for the employees of its major industry. The campaign, if successful, will mean an increase in the annual income of the city amounting to several times the cost of the Chamber of Commerce. To date, splendid progress has been made, both locally and with state officials. The latter part of May a big Forum meeting was held, at which Governor Groesbeck and Hon. George B. Lord, chairman of the Michigan Commission of Inquiry into Taxation, spoke. The matter will come before the next session of the Legislature for action, at which time Escanaba hopes to obtain relief.

ORREN I. BANDEEN,
Secretary, Escanaba Chamber of Commerce.

The Halsey-Taylor Stream is Automatically Controlled



Note how the two streams converge as they rise. In converging these streams set up a mechanical interference in the stream that retards the movement of the water at the apex of the arc, building a convenient, confortable drinking mound.

Below is just one Halsey Taylor type in general use throughout the country in municipalities, factories and schools.

Never too High— Never too Low

The fool-proof automatic stream control of Halsey Taylor drinking fountains is regarded everywhere as an achievement—a BIG step forward—a dependable automatic control.

The Halsey Taylor fountain was first to develop the perfect drinking stream —and this advance also has not yet been met in other fountains.

With these two dominant features, a perfect drinking stream and automatic stream control, the disagreeable things heretofore found in drinking fountains are entirely eliminated.

Illustrating No. 562 fountain head with guard. Note the symmetrical lines of this fountain head. Just a small detal but it indicates the fact that nothing is overlooked in Halsey Taylor fountains that might add to their desirability.

You'll find no water pools around Halsey Taylor fountains equipped with the automatic control; and you'll find folks drinking in comfort where the Halsey Taylor 2-stream side jet projector of is in use.

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Warren, Ohio

The City's Legal Rights and Duties

Information for City Attorneys and Other Municipal Officers, Summarizing Important Court Decisions and Legislation

Conducted by A. L. H. Street, Attorney at Law

City Held Not Liable for Loss of Private Property Through Insufficient Supply of Water for Fire Protection

In a case lately before the North Carolina Supreme Court (Mack v. Charlotte City Waterworks et al., 107 Southeastern Reporter, 244) plaintiff sued to recover damages for destruction of a building by fire, attributed by him to neglect of defendants to furnish a timely and adequate water-supply to enable the fire department to extinguish the fire. The Court holds that there is no liability, because defendants were engaged in the performance of a governmental function.

The city of Charlotte is under a commission form of government, and its municipal water-works system is under a board of water commissioners constituting a part of the city government.

Referring to statutes under which action of the commissioners is made municipal action, etc., the Supreme Court observes:

"This being true, our decisions hold and the present statute is in full affirmance of the principle . . . that a municipality may not be held liable at the suit of individuals for injuries caused by its officials when in the exercise of governmental functions and matters affecting only the public interests, unless such liability is expressly recognized and provided for by statute.

"In a recent case on this subject, this limitation on the right to sue for such an injury is stated as follows:

"'The principle upon which a municipality engaged in supplying water to the individual citizen, under contract for profit or pay, must be considered and dealt with as a private owner, applies to the ordinary burdens and liabilities incident to their private business relations, and not to its work for the public generally, such as procuring its water-supply and extending it, providing for fire protection and sanitation purposes, and the like, for therein the municipality is to be regarded as a governmental agency, and, as such, possessing and capable of exercising the powers and privileges conferred upon it by law.' Felmet v. Canton, 177 N. C. 52, 97 S. E. 728. . . .

"And if there should be any doubt that this is now the approved position with us, the matter would seem to be put at rest by section 2807, Consolidated Statutes, which provides in part as follows:

"'The city may . . . maintain its own light and water-works system to furnish water for fire and other purposes, and light to the city and its citizens, but shall in no case be liable for damages for a failure to furnish a sufficient supply of either water or light,' etc.

"Such a statute has been held to be well within the legislative powers to the extent that it applies to 'official acts, governmental in character, or for the benefit of the public generally.'"

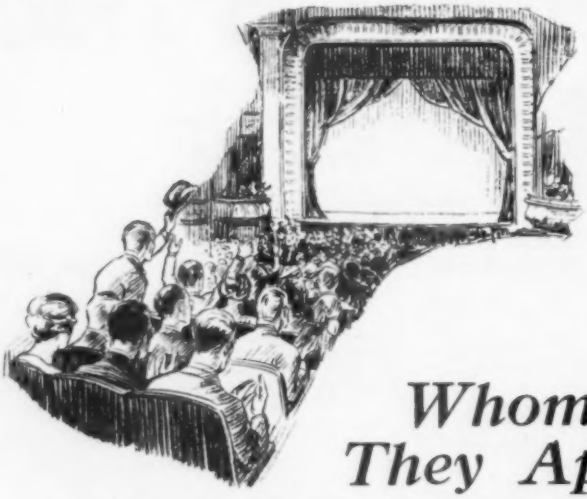
City Not Liable for Injury to Pedestrians Through Negligence in Street Cleaning Operations

That the law is still unsettled on the question as to just when a city is to be excused from responsibility for private injuries inflicted through negligence of municipal employees, on the ground that the accident occurred in the course of executing some governmental function, as distinguished from the execution of such non-governmental function as operating a public utility, is shown by the circumstance that the members of the United States Supreme Court were not able to concur in opinions as to whether street cleaning constitutes a governmental activity.

A portable tank used by the District of Columbia in sprinkling the streets of Washington preparatory to sweeping them was being filled at a water plug, when the employee in charge dropped the plug cover, thereby injuring plaintiff. Suit against the District for damages followed, and the Court of Appeals for the District certified the following question to the Supreme Court of the United States.

"Is the sprinkling of the streets to keep down dust for the purpose of the comfort and health of the general public a public or governmental act as contradistinguished from a private or municipal act, which exempts the District of Columbia from liability for the injuries caused by one of its employees engaged therein?"

Six of the members of the highest court



Whom Will They Applaud ?

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We should like to tell you more about street lighting—how developments have rendered obsolete many existing installations and what can be done to improve the present street lighting in your own town. Without obligation let us send you our booklet, "Scientific Street Lighting," a guide to good practice, just off the press, and have one of our engineers call on you. Our engineering department is generally recognized as the headquarters of scientific efficient illumination.

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A.C. 8-'22

of the land concurred in the judgment in favor of the District, holding that the defendant was immune from responsibility in the case on the ground of being engaged in the exercise of purely governmental functions at the time of the accident. Messrs. Justices Holmes, Brandeis and Clarke dissented. The gist of the majority opinion appears in the following quoted excerpt from it:

"It is established doctrine that when acting in good faith municipal corporations are not liable for the manner in which they exercise discretionary powers of a public or legislative character. A different rule generally prevails as to their private or corporate powers. . . .

"Application of these general principles to the facts of particular cases has occasioned much difficulty. The circumstances being stated, it is not always easy to determine what power a municipal corporation is exercising. But, nothing else appearing, we are of opinion that, when sweeping the streets, a municipality is exercising its discretionary powers to protect public health and comfort and is not performing a special corporate or municipal duty to keep them in repair. This conclusion, we think, accords with common observation, harmonizes with what has been declared heretofore concerning liability of the District of Columbia for torts, and is supported by well-considered cases." (Harris vs. District of Columbia, 47 Supreme Court Reporter, 610.)

Necessity for Conformity of Bids to Notice for Proposals

A notice inviting bids for the furnishing of a truck to be used in the fire department of a city specified a two-wheel, front-drive, aerial truck of no less than 100 horse-power. A bidder proposed to furnish a machine of an entirely different character as a substitute for that described in the notice to bidders, at a lower price than the bidders according to the specifications published. Held, that the city was not required to consider such proposal.

The "lowest bidder" within a statute requiring a municipality to award a contract to the lowest bidder must be a bidder who conforms to the requirements in the notice to bidders, and not one who proposes a substitute not conforming to the published specifications.

Where the common council of a city inviting bids for the furnishing of such a truck reserves the right to determine which of different trucks offered is best for the city, that reservation is limited to proposals for a truck of the required character, and the legality of the reservation cannot be questioned by a bidder whose proposal does not comply with the notice to bidders, for he has no right to compel his bid to be accepted, and has no interest in the determination of the question between other bidders whose proposals conform to the specifications. Whatever rights the latter may have does not concern it, for it was not a proper bidder. (New Jersey Supreme Court, International Motor Co. vs. City of Plainfield, 115 Atlantic Reporter, 391.)

City Cannot Reimburse Its Employee for His Personal Liability for Negligence, Although Engaged at the Time in the Course of His Employment

A municipal water board has no right to reimburse an employee who was compelled to pay damages to persons injured through his negligence while not directly engaged in work for the board or in protecting its property or rights, holds the Minnesota Supreme Court in the case of State vs. Foote, 186 Northwestern Reporter, 230.

The superintendent of mechanical equipment of the St. Paul Water Board was driving between places where his services were required in the course of his employment. He used an automobile furnished by the Board and negligently collided with another automobile, injuring its occupants. The injured persons recovered judgment against him, and the Board sought to reimburse him. But the Court upheld the City Comptroller in his refusal to audit and approve the claim. The Court said:

"The funds within the control of the Board are not derived from direct taxation, but from water rents, except as the cost of laying watermains is assessed as benefits against abutting property. But that notwithstanding, we must consider the moneys within the Board's control as public moneys in the sense that the same can only be used for legitimate ends in carrying on the business for which the Board is organized. The Board exists solely to furnish the city and its inhabitants with a public utility. It is not for private gain. In so far as water is furnished for fire protection, sprinkling, street cleaning, public baths, and public drinking fountains, the payment to the Board is made out of the city's funds. The City Council fixes the rates which the Board may collect. It is plain that the funds in the hands of the Board are, at least, trust funds in which the city and its inhabitants are interested, and therefore may be called public funds, misappropriation of which courts will prevent."

North 15th Street, Richmond, Ind.—Macadam maintained with "Tarvia-B"

Liberty Pike, Richmond, Ind.—"Tarvia-B" over waterbound macadam.

Chester Pike, Richmond, Ind.—Macadam maintained with "Tarvia-B"

Here's what Richmond, Ind., thinks of Tarvia—

In 1918 Richmond stepped out of the mud and dust and inaugurated a program of mudless, dustless, all-year Tarvia roads. Describing Richmond's experience with Tarvia, Mr. D. B. Davis, City Civil Engineer, writes:

"It is with considerable pleasure that I report to you our success with Tarvia. This year makes the fourth successive one in which we have used your materials.

"We have developed here a Tarvia treated gravel pavement which is so popular for residence streets that the demand each year is beyond our ability to construct. Observation of the service rendered by streets which have been surface treated during the past four years has convinced our people of the economy and serviceability of Tarvia for this purpose.

"In connection with our surface treating we repair all small depressions which occur in our 40 miles of gravel and macadam streets. A maintenance patrol is employed constantly on this work and, odd as it may seem, we have no ruts in any of our pavements."

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Validity of Proceedings to Acquire Public Utilities—Notice of Election

An election to determine whether a town should "purchase, repair, and extend the electric lighting plant now existing in said town" was not invalid as calling for a vote on matters that should have been separated, holds the South Carolina Supreme Court in the case of Town of Summerville vs. Bank of Dorchester, 105 Southeastern Reporter, 32. The reasoning of the Court on this point, and its conclusions on other objections raised against the election, are indicated in the following extract:

"We have held that, where the purposes are entirely separate and distinct, as, for instance, the issuance of bonds for water-works and sewerage, the questions must be separately submitted. Herbert vs. Griffith, 99 S. C. 1, 82 S. E. 986. The reason is obvious. But in the same case we said that separate questions, germane to, or involved in, one main purpose, need not be separately submitted; for instance, whether bonds shall be issued to purchase, repair, and extend an existing system of waterworks, because they are so closely related to and involved in the main purpose as to amount to but one question—that of supplying the people with water. So, here, purchase, repair, and extension were properly submitted as one question, because they are all involved in the main purpose of supplying the people with light.

"The submission did not specify the rate of interest to be paid on the bonds. That was not necessary. The voters knew that the bonds must bear interest at some rate to be specified thereon, and they knew that the Commissioners could agree to pay the highest rate allowed by statute, but no more, and also that they could, and presumably would, fix the lowest rate at which they could sell the bonds. It is impossible to submit every detail of such a transaction to popular vote. Some things must necessarily be left to the judgment and discretion of those whom the people have chosen to represent them.

"There is an ice-manufacturing plant in connection with the electric lighting plant, which is to be included in the purchase as a part of the latter. That is no objection to the validity of the bonds. The purchaser of the bonds is not bound to see that the commissioners apply the proceeds to the purposes intended, and no other. He may presume that the commissioners will proceed according to law in the performance of their duties."

On the Calendar of Conventions

AUGUST 8-16.—CHAUTAUQUA, N. Y.
Open Forum National Council. Annual assembly. Secretary, Robert S. Holmes, Daytona Beach, Fla.

AUGUST 15-18.—SAN FRANCISCO, CALIF.
International Association of Fire Engineers. Annual meeting. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

AUGUST 19-26.—MINNEAPOLIS, MINN.
American Institute of Park Executives. Annual convention. Secretary-Treasurer, Emmett P. Griffin, Superintendent of Parks, East St. Louis, Ill.

AUGUST 21-SEPTEMBER 2.—EVANSTON, ILL.
National School for Commercial Secretaries. Address: Robert B. Beach, Business manager, Association of Commerce, Chicago, Ill.

AUGUST 22-25.—NEW BEDFORD, MASS.
International Association of Municipal Electricians. Annual convention. Secretary, Clarence R. George, City Electrician, Houston, Tex.

AUGUST 28-31.—CHATHAM, ONT.
Dominion Association of Fire Chiefs. Annual convention. Secretary, Chief James Armstrong, Kingston, Ont.

AUGUST 28-SEPTEMBER 2.—DETROIT, MICH.
National Safety Council. Annual Safety Congress. Secretary, W. H. Cameron, 168 North Michigan Avenue, Chicago, Ill.

AUGUST 29-31.—WILLIAMSPORT, PA.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.

SEPTEMBER 12-15.—NEW BEDFORD, MASS.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 14-16.—TORONTO, ONT.
American Association of Port Authorities. Annual convention. Secretary, M. P. Fennell, Jr., 57 Common Street, Montreal, Canada.

SEPTEMBER 18-21.—OMAHA, NEBR.
Association of American Cemetery Superintendents. Annual convention. Secretary, W. B. Jones, Highwood Cemetery, Pittsburgh, Pa.

SEPTEMBER 18-22.—MINNEAPOLIS, MINN.
National Tax Association. Annual conference. Secretary, Alfred E. Holcomb, 195 Broadway, New York, N. Y.

SEPTEMBER 18-23.—PALO ALTO, CALIF.
Western Summer School of Community Leadership. Address: Mrs. C. A. Simmons, Registrar, American City Bureau, Merchants' Exchange Building, San Francisco, Calif.

SEPTEMBER 19-23.—PALO ALTO, CALIF.
League of California Municipalities. Annual convention. Executive secretary, W. J. Locke, Ninth floor, Pacific Building, San Francisco, Calif.

SEPTEMBER 21-26.—ROME, ITALY.
International Housing Congress. Address: C. B. Purdom, 3 Grays Inn Place, London, W. C., England.

SEPTEMBER 25-28.—HOT SPRINGS, ARK.
Southwest Waterworks Association. Annual convention. Secretary, E. L. Fulkerson, 617 Washington Street, Waco, Tex.

OCTOBER 1-6.—CLEVELAND, OHIO.
American Society for Municipal Improvements. Annual convention. Secretary, Charles Carroll Brown, P. O. Box 234, St. Petersburg, Fla.

OCTOBER 5-7.—PULLMAN, WASH.
Washington Association of Commercial Organization Secretaries. Annual meeting. Secretary, Vaughn H. Clearman, Wenatchee, Wash.

OCTOBER 9.—HARRISBURG, PA.
Pennsylvania Commercial Secretaries Association. Annual meeting. Secretary-Treasurer, B. W. Grills, Secretary Chamber of Commerce, McKeesport, Pa.

OCTOBER 9-12.—ATLANTIC CITY, N. J.
Playground and Recreation Association of America. Recreation Congress. Secretary, H. S. Braucher, 1 Madison Avenue, New York, N. Y.

OCTOBER 16-19.—CLEVELAND, OHIO.
American Public Health Association. Annual meeting. Secretary, A. W. Hedrich, 370 Seventh Avenue, New York, N. Y.

OCTOBER 17-19.—PITTSBURG, KANS.
League of Kansas Municipalities. Annual convention. Secretary, John G. Stutz, University of Kansas, Lawrence, Kans.

OCTOBER 23-25.—DETROIT, MICH.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, John E. Northway, Chamber of Commerce, Hamilton, Ohio.

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THE CONTROL OF CITY SCHOOL FINANCES

George W. Frasier, Ph.D., Director of Classification and Statistics, Public Schools, Denver, Colo. The Bruce Publishing Company, Milwaukee, Wis. 1922. 132 pp. Illustrated. $1.25.

This book is devoted to the thesis that the schools should be independent of municipal meddling with budgets and school moneys. It points out the advantage to a community of having school finances controlled by school boards. The book takes up successively the general problem of financing, the relation of the board of education to municipal developments, the legal administration of financial control, the views of experts on the subject and finally summarizes the facts developed by the "Committee for Chamber of Commerce Cooperation with Public Schools" which was organized by the American City Bureau in 1921 and of which Dr. Strayer served as Chairman. Using these figures, the book seeks to demonstrate that school systems which are independent are far more efficient and render greater service than those in cities where there is municipal control and interference. A valuable hand book for members of boards of education and school statisticians.

THE RURAL MIND AND SOCIAL WELFARE

Ernest R. Groves, with Foreword by Kenyon L. Butterfield, President of Massachusetts Agricultural College. The University of Chicago Press, Chicago, Ill. 1922. XIV + 205 pp. $2.00.

This book attempts to analyze in detail the rural social mind for the purpose of emphasizing its significance in our national life. It maintains that rural people have a greater social function than merely to grow food for city dwellers. Among the subjects which it covers are the social contribution of primitive agriculture, the drift toward cities, country life and the various instincts, the country church and the rural mind, and the psychology of rural organizations. The increasing attention given to rural matters which makes this book especially timely is based on neither sentimental nor class interests. As our civilization tends to become more urban, we need to appreciate the social value of rural life.

SOCIETY AND ITS PROBLEMS

An Introduction to the Principles of Sociology. Grove Samuel Dow, Professor of Sociology in Baylor University. Thomas Y. Crowell Company, New York. 1922. XIV+594 pp. $2.75.

Although intended primarily for students of sociology, this book is not limited to them in its field. It is divided into six parts covering respectively the nature of sociology, problems pertaining to population, social institutions, an analysis of society, social maladjustment, and social progress. It points out that our handling of all these problems is growing better and, while many yet remain unsolved, we are steadily working toward a solution. The book is an exceedingly valuable survey of the whole problem which should be of real help to students and workers along philanthropic and social lines.

COMMUNITY CIVICS

Edgar W. Ames, M. A., Head of the Department of History and Civics, Troy High School, Troy, N. Y., and Arvie Eldred, M. A., Superintendent of Schools, Troy, N. Y. The Macmillan Company, New York. 1922 XIV+386 pp Illustrated. $1.32.

The teaching of the mechanics of government is not enough. The authors have undertaken to demonstrate their belief that the most important work of the teacher is the making of citizens, that children must learn how people live together in communities, must study the relationshop of the individual to his fellowman and learn how governments have been instituted for his benefit. The book traces the evolution of the community from the beginning, the home, the family, and the community and takes up the big subjects of education, the protection of life and property, play, transportation, communication, the courts, social welfare, the government of large and small communities and the nation and their relation to the individual. Profuse illustrations well selected add to the value of this text-book, and questions which have been tried out in practise make the use of the book an easy task.

ORGANIZING THE COMMUNITY

A Review of Practical Principles. B. A. McClenahan, M. A. Assistant Director, Missouri School of Social Economy, St. Louis. Edited by George B. Mangold, Ph.D., Director Missouri School of Social Economy, St Louis.

The Century Company, New York. 1922. XVIII+260 pp. Charts. $1.75.

This book takes up the problem of organizing the community from the social worker's standpoint. It defines and describes the community, the social survey, survey methods and data, the organization of a small town, rural community organizations,, a county plan, and plans of the American Red Cross and other specialized agencies. It does not attempt to discuss organizations within a city as that constitutes a subject for a separate volume. For the social worker in whatever field, this book will prove of value in clarifying his thoughts.

HIGHWAY ENGINEERING AND TRANSPORT

Proceedings of a Regional Conference for the Study of Highway Engineering and Highway Transport, held at the Agricultural and Mechanical College of Texas in cooperation with the Highway and Highway Transport Education Committee, United States Bureau of Education, February 6 and 7, 1922. Edited by J. C. Nagle, Dean of Engineering. Published as Bulletin 25, Texas Engineering Experiment Station, College Station, Texas, May 1, 1922. 72 pp. Two of the addresses deal with the relation between good roads and good education. (Apply to the publishers.)

CITY ORDINANCES

"What Other City Councils Are Doing." Mimeographed list of references to ordinances introduced in or passed by city councils of cities other than Chicago from January 1 to May 31, 1922. Prepared by the Bureau of Statistics and Municipal Reference Library, 1005 City Hall, Chicago, Ill. (Apply to Fredrick Rex, Municipal Reference Librarian, at the address above.)

WATER-SUPPLY FOR CLARKSBURG, W. VA.

A pictorial review of the Department of Water Supply of Clarksburg by Scotland G. Highland, General Manager. Prepared for 1922-23. The views well illustrate the various features of Clarksburg's water plant, and show the cost of water waste through leaking faucets. The pamphlet also contains a list of nearly 100 foreign English newspapers, with brief comment on their general policy. (Apply to Mr. Highland.)

CITY PLANNING AND ZONING

A comprehensive budget of pamphlets on city planning and zoning, sold at cost price, $1.50. Including: "Modern City Planning, by Thomas Adams; "The Law of the City Plan," revised 1922, by Frank B. Williams; "Zoning," revised 1922, by Edward M. Bassett; "Law of Zoning," by Herbert S. Swan; "Special Assessments" (means of financing municipal improvements), by Committee on Sources of Revenue, National Municipal League. (Apply to National Municipal League, 261 Broadway, New York, N. Y.)

GRADE CROSSING ELIMINATION IN PATERSON, N. J.

"Separation of Street and Railroad Grades, Paterson, N. J." A report of the City Plan Commission. By Herbert S. Swan and George W. Tuttle. 1922. 29 quarto pp Views and drawings. "The time has come when half-way measures to relieve conditions will no longer do—the problem must be approached in its broader and more comprehensive aspects as a city-wide problem instead of a local condition affecting a single street or street intersection." (Apply to City Plan Commission, Paterson, N. J.)

A ZONING PRIMER

Prepared by the Advisory Committee on Zoning appointed by Secretary Hoover. 8 pp. 1 illustration. The information is simply and clearly presented under the following heads: What Is Zoning?; Why Do We Need Zoning?; Zoning Protects Property and Health; Zoning Reduces the Cost of Living; Zoning Is Legal; How to Get Started; A Zoning Program; What Cities and Towns Have Accomplished by Zoning; Where to Get Information. The Division of Building and Housing of the Department of Commerce, Washington, D. C., will furnish information concerning zoning progress in the United States. (The price of this pamphlet is 5 cents. Apply to the Government Printing Office, Washington, D. C.)

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SIX reasons why Hollowspun reinforced concrete lighting standards were adopted in Milwaukee, Wisconsin:
1—Concrete increasing in use
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3—Practically without deterioration
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5—Best possible appearance
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We have just published an illustrated description of the complete street lighting installation in Milwaukee. It should be in your file. A copy will be sent free on request.
MASSEY CONCRETE PRODUCTS CORPORATION
Peoples Gas Building, Chicago

A CHARTER PRIMER

Prepared by the Taxpayers' League, of Duluth, Minn. No. 10, May 8, 1922, issue of The Taxpayers' Business. 16 pp. 4 charts of different types of municipal government. Arguments for and against each type. (Apply to the League.)

THE TEACHING OF CITIZENSHIP

An outline for Grades One to Nine inclusive, by Henry J. Peterson. Published by Houghton Mifflin Company, Boston. 90 pp. By emphasizing the keynote of cooperation of citizens through the idea of membership in certain groups, this handbook makes the pupils realize what our government means to them and what duties they owe the government. Price 28 cents. (Apply to publishers.)

PHILADELPHIA'S WATER-SUPPLY

An analysis of the need of the water service of Philadelphia with reference to the proposed substitute source of water-supply, and with a historical review of the water-works development. Prepared by the Bureau of Municipal Research of Philadelphia, May, 1922. 54 pp. Illustrated. (Apply to the Bureau.)

JUVENILE COURTS

Proceedings of the Conference on Juvenile-Court Standards, held under the auspices of the U. S. Children's Bureau and the National Probation Association, Milwaukee, Wis., June 21-22, 1921. Publication No. 97 of the Children's Bureau. 112 pp. Miss Julia Lathrop said, "Have we prevailing and accessible for the children and youth of our country who are brought into courts those provisions for their protection, guidance, or restraint which have failed them elsewhere?" (Apply to Government Printing Office, Washington, D. C.)

ZONING CHICAGO

A quarto, 12-page appeal to the citizens of Chicago to interest themselves in the work of the Chicago Zoning Commission so that a true "people's ordinance" may be drafted covering this matter. Views and colored maps. April, 1922. Presenting the facts that are essential to an understanding of the need for, and the principles of, this work. (Apply to Charles H. Wacker, Secretary of the Commission, 163 West Washington Street, Chicago, Ill.)

VICE REPRESSION IN NEW YORK CITY

Annual report of the Committee of Fourteen in New York City for 1921. 32 pp. 1922. The chairman of the Committee says, "Unfortunately vice does still exist. * * * * But that New York is the cleanest of the world's largest cities is true and was true in 1918." (Apply to Frederick H. Whitin, secretary of the committee).

SCHOOL SALARIES

"Salaries of Administrative Officers and Their Assistants in School Systems of Cities of 25,000 Inhabitants or More," By Walter S. Deffenbaugh, specialist in city school systems, U. S. Bureau of Education. Bulletin, 1921, No. 30, of the Bureau of Education. 1922. 38 pp. Tables and lists, with analytical comment and suggestions for bettering conditions in the organization of school systems. (Apply to the Government Printing Office, Washington, D. C.)

ROADS IN ALGER COUNTY, MICH.

Report of Alger County Road Commission from date of inception, 1906, to January 1, 1922. 1922. 46 pp. Well illustrated. (Apply to Thos. N. Hannah, County Clerk, Munising, Mich.

Municipal Reports

Baltimore, Md.—Twenty-seventh Annual Report of the Free Public Bath Commission, to the Mayor and City Council for the fiscal year ended December 31, 1921. (Apply to Robt. F. G. Kelley, Secretary and Superintendent of the Commission).

Baltimore, Md.—The Ordinance of Estimates for the year 1922, with Detailed Statements of the Appropriations (Classified under Department Organization Units), for the Maintenance of the Government of the City. (Apply to Peter E. Tome, City Comptroller and Secretary to the Board of Estimates.)

Boston, Mass.—Annual Report of the Public Works Department for the year 1920. (Apply to Thomas F. Sullivan, Commissioner of Public Works, Boston, Mass.)

Cambridge, Mass.—Fifth Annual Report of the Planning Board to the City Council, for the year 1921. (Apply to the City Clerk.)

Charleston, S. C.—Fifth Annual Report of the Commissioners of Public Works for the Water Department. 1921. 77 pp. Well illustrated. (Apply to J. E. Gibson, Manager and Engineer, Water Department, 14 George Street, Charleston, S. C.

Chicago, Ill.—Twenty-fourth Annual Report, Department of Gas and Electricity. 1920. (Apply to William G. Keith, Commissioner of Gas and Electricity.)

Cincinnati, Ohio.—Annual Report of the Department of Street, Sewer and Catch-Basin Cleaning for the year 1921. (Apply to Fred Maag, Superintendent, Street Cleaning Department.)

Detroit, Mich.—Police Department report on crime reduction in 1921. Issued February, 1922. (Apply to Dr. James W. Inches, Commissioner).

Duluth, Minn.—Twenty-third Annual Report of the Water and Light Department for the year ending December 31, 1921. (Apply to P. G. Phillips, Commissioner of Public Utilities, Duluth, Minn.)

Erie, Pa.—Annual Report of the Superintendent of of the Department of Accounts and Finance. January 3, 1922. 38 pp. (Apply to Thos. Mehaffey, Superintendent of Accounts and Finance.)

Erie, Pa.—Budget, 1922. "Where the Tax Dollar Goes." 28 pp. (Apply to T. Hanlon, City Clerk.)

Gloversville, N. Y.—Eighth Annual Report of the Department of Health and Sanitation, for 1921. (Apply to William E. Walsh, Clerk of the Department.)

Greenwood, S. C.—Annual Reports of the Town Council and the Water and Electric Light Plant. Receipts and disbursements for the year 1921. (Apply to Robert J. Cartledge, Jr., Clerk, Greenwood, S. C.)

Holland, Mich.—Annual Report of the Board of Public Works for the Fiscal Year ending December 31, 1921. (Apply to Gerrit Appeldorn, Clerk of the Board.)

Indianapolis, Ind.—Report of the Board of Sanitary Commissioners of the Sanitary District for the year ending December 31, 1921. (Apply to Jay A. Craven, Secretary, Board of Sanitary Commissioners, Indianapolis, Ind.)

Johnstown, N. Y.—Forty-fourth Annual Report of the Board of Water Commissioners, filed January 21, 1922. (Apply to Grover E. Yerdon, City Clerk.)

Kansas City, Kans.—Annual Report of the Finance Commissioner for the year 1921. (Apply to A. H. Strickland, Commissioner of Finance and Revenue.)

Los Angeles, Cal.—Annual Message of George E. Cryer, Mayor. January 3, 1922. (Apply to the Mayor.)

McPherson, Kans.—Eighth Annual Report of the City, under commission government. (Apply to Ellen Lundstrom, City Clerk.)

Muskegon, Mich.—First Annual Report of the Efficiency Bureau. Published 1922. Mimeographed. Many blue-prints. (Apply to W. E. Hunter, Secretary of the Bureau.)

Muskegon, Mich.—Quarterly Report of the Administrative Department. Mimeographed. Many tables (Apply to I. R. Ellison, City Manager.)

New York, N. Y.—Report of the Chief Engineer of the Board of Estimate and Apportionment for the year 1920. (Apply to Arthur S. Tuttle, Chief Engineer.)

Rockford, Ill.—Twelfth Annual Report of the Board of Commissioners, Rockford Park District, for the year 1921. (Apply to Ruby I. Minard, Secretary of the Board.)

Saint John, N. B.—Report and Accounts of the Corporation for year ending December 31, 1921. (Apply to Adam P. Macintyre, Comptroller.)

Spokane, Wash.—Auditor's Annual Report for year ending December 31, 1921. (Apply to A. W. Burch, City Auditor.)

Springfield, Mass.—Forty-eighth Annual Report of the Board of Water Commissioners to the City Council, together with the reports of the Water Registrar, Superintendent and Chief Engineer to the Board for the year 1921. (Apply to Alfred R. Hathaway, Clerk of the Board.)

Springfield, Mass.—Fortieth Annual Report of the Health Department. Year ending December 31, 1921. (Apply to William L. Young, clerk, Health Department.)

Wallingford, Conn.—Report of the Electric Works for the year ending July 31, 1921. (Apply to A. L. Pierce, General Manager.)

TRINIDAD IN COLUMBUS, O. High Street, opposite the State Capitol Building, paved with TRINIDAD Lake Asphalt in 1915. Still in splendid condition.

You're the Judge

—and here's the evidence in Columbus

Thirteen streets in Columbus, O., have TRINIDAD Lake Asphalt pavements that average 30 years in age.

Today, in Columbus, there are 8 1/3 times more TRINIDAD Lake Asphalt pavements than all other asphalts combined.

Columbus has found—as hundreds of other municipalities—that the so-called "cheaper" asphalts are too expensive and troublesome to use.

TRINIDAD Lake Asphalt—a product of the Ages—makes a noiseless, resilient, attractive pavement that will last for years with little or no cost for maintenance.

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Methods, Materials and Appliances

News for City and County Engineers, City Managers, Water-Works Superintendents, City Controllers, Park Superintendents, Purchasing Agents, and Others Interested in the Economical Construction and Efficient Operation of Public Improvement Undertakings

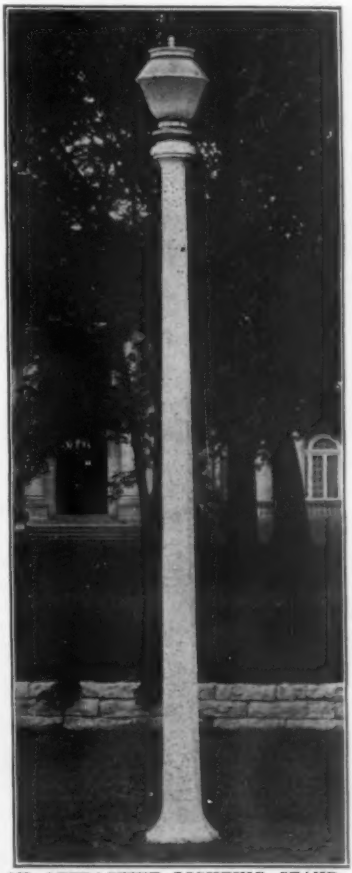
Improving the Distribution of Light from Street Lamps

In a booklet entitled "Scientific Street Lighting," the engineers of the Holophane Glass Company, Inc., 342 Madison Avenue, New York City, describe in detail the theories which this company has worked up on street lighting. One section of the booklet is devoted to the subject of glare and economic waste in most of the present-day installations. Glare comprises two distinct effects—the ocular discomfort which one experiences in looking at an intensely bright light, and the blinding effect of the lamp. Shielding the bare lamp with a white glass globe or refractor overcomes the ocular discomfort, but does not decrease the blinding effect. So serious is this blinding effect that at a height of 13½ feet a 4,000-lumen lamp in a white glass globe produces a blinding effect equal to a waste of half the light; that is to say, if this blinding effect could be eliminated, a 2,000-lumen light would light the streets so that objects could be seen just as clearly as with a 4,000-lumen lamp under the conditions stated.

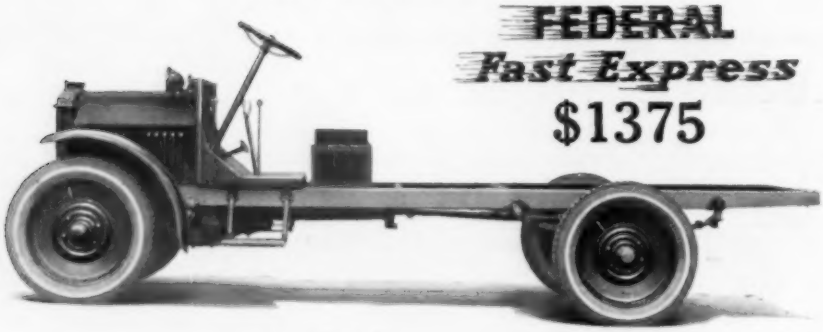
The booklet further states that one practical way to avoid serious waste due to blinding effect, commonly called glare, is to employ higher mounting heights; compared with a mounting height of 13½ feet, the glare is only one-half as bad at 18½ feet and only one-quarter as bad at 27 feet. To-day 15 feet is regarded as the minimum mounting height permissible under first-class practice. The Holophane Glass Company states that possible mounting heights of 25 to 35 feet are to be greatly preferred with regard to the quality of lighting.

There is a tendency toward higher illumination values on streets. In order to make the streets essentially safe and as convenient as by day, non-traffic streets should have an illumination of not less than one and one-third times full moonlight, arterial streets not less than four to seven times full moonlight, and promenade or main business district streets not less than sixteen times full moonlight. The last-named streets may well be lighted to a higher illumination, justified by the additional advertising value so obtained.

One of the first steps taken by the Holophane Glass Company for placing street lighting on a scientific basis was to determine the ideal light distribution curves which are necessary for uniform lighting on the street surface, for given ratios of spacing to the mounting height. This constituted a pioneer effort and resulted from an entirely different attitude towards the problem from that of merely installing any light source and judging the results with any established standard. In the investigation it was found that the spacing must be as close as 12 times the mounting height to make obtainable even a remote approximation to uniform lighting, and as close as 8 times the mounting height to produce a fully satisfactory approximation to uniform lighting. In attempting to approximate the ideal curves of light distribution, the Holophane Company solved the problem by the design of its special auxiliary known as Holophane refractors.



AN ATTRACTIVE LIGHTING STANDARD WITH HOLOPHANE REFRACTOR



FEDERAL
Fast Express
$1375

Another
FEDERAL

The Most Efficient Truck You Can Buy for Rapid, Certain Haulage

At all times and under all conditions, ***fast*** and ***genuinely economical*** this Federal FAST EXPRESS is the most efficient truck a municipality can own. At $1375, it offers an unequalled value in reliable transportation service. Built by Federal, its superior worth is assured not only by the reputation of its makers, but by the known high quality of the thoroughly-tested specialized units in every part of its construction.

These Specialized Units Insure Maximum Efficiency—

CAPACITY—2000 lbs.; body allowance, 900 lbs.; chassis weight, 2950 lbs.; total, 5850 lbs.; wheelbase, 132″; tread, 56″; loading space back of seat, 110 inches.

MOTOR—Continental J-4; 4-cylinders; L-head; Mono Block type; 3-bearing crank shaft; 3-point suspension; force feed lubrication system through hollow crank shaft; bore, 3¾″; stroke, 5″; 30 horsepower at normal engine speed.

IGNITION—Eisemann Magneto with manually controlled spark.

CARBURETOR — Zenith; central jet, float feed, automatic.

COOLING SYSTEM—By fan and water circulated by centrifugal water pump of ample proportions through a Federal type detachable core radiator with pressed steel tanks and side members chemically treated to prevent rust.

CLUTCH—Borg & Beck dry plate; two 10″ asbestos fabric discs enclosed in Bell housing; easily adjusted for wear.

TRANSMISSION — 3 speeds forward and one reverse; selective; sliding; stub tooth; spur gear type; mounted on flywheel housing; splined main shaft; annular ball and roller bearings of generous size throughout.

PROPELLER SHAFTS—Tubular, provided with three Universal Grease tight joints of ample proportions. Supported at center on self-aligning ball bearings.

REAR AXLE — Timken-Detroit; worm drive with differential mounted on Timken-Roller bearings; semi-floating; completely enclosed in one-piece pressed steel housing; gear ratio standard 5.6 to 1.

FRONT AXLE — Timken-Detroit; drop forged I-beam; tapered roller bearings.

BRAKES — Internal duplex; expanding type; 15″ x 2½″ foot and emergency, each having four Raybestos faced shoes operating in drums on rear wheels.

FRAME — Pressed steel; channel section; 3/16″ thick; 5″ deep at center; 30½″ wide at front and 34″ wide back of seat; height from ground loaded, 29½″.

SPRINGS — Chrome Vanadium steel; semi-elliptic type; front 38″ x 2¼″; rear, 50″ x 2½″; 8 leaves rear.

STEERING GEAR—Gemmer irreversible type; worm and worm wheel; ample adjustment for wear; bearings of generous size; 18″ hand wheel.

GASOLINE SYSTEM—Sheet steel tank; 12½ gals.; tinned inside and out; mounted on chassis under seat, with Stewart vacuum tank on dash under hood.

WHEELS—Dished and tapered demountable disc wheels; valve connection outside.

TIRES—Pneumatic U. S. Royal cords; truck type; non-skid; 33 x 5″ front and rear.

CONTROL — Transmission and brake levers mounted on transmission housing, center of chassis; steering gear column on left; accelerator pedal on toe board; hand throttle and spark control lever on steering column; ignition switch and carburetor choke are provided on the dash.

CHASSIS LUBRICATION — Alemite grease connections with efficient high pressure grease gun; no grease cups to be filled by hand.

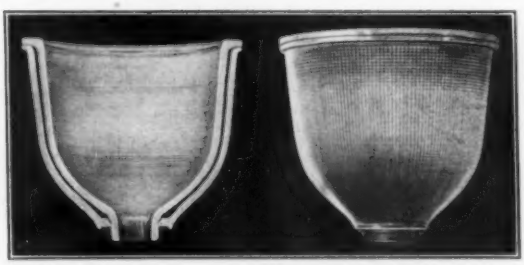
DASH EQUIPMENT — Dash, toe boards, fenders and running boards heavy pressed steel, floor board wood.

ELECTRIC EQUIPMENT — Remy electric starter and generator; electric horn; electric side, tail and dash lights with special hard service battery mounted under seat, easily accessible.

CHASSIS PRICE—$1375 f. o. b. Detroit, freight and war tax additional. Price includes complete set of tools, jack, oil can and hand pump.

Phone your Federal dealer, or write or wire the factory for definite proof of the economies this truck will effect in your line of business. Your inquiry will have prompt and careful attention.

FEDERAL Motor Truck Company, Detroit, U. S. A.



SECTIONAL VIEW OF A STREET LIGHT REFRACTOR OF THE BOWL TYPE, SHOWING THE RELATION OF THE HORIZONTAL AND VERTICAL PRISMS

A Holophane refractor consists of two elements of clear glass, sealed one within the other. The inner element has horizontal prisms on its outer surface, and the outer element has vertical or horizontal prisms, depending upon the particular type on its inner surface. This means that both the inner and the outer surfaces of the refractor as a unit are of smooth glass and that the light distribution is accomplished by prismatic action rather than by surface reflection as in ordinary reflectors. The horizontal prisms of the inner element bend the light from the lamp so as to make it a maximum at any desired angle below the horizontal. The vertical prisms of the outer element of all types except the dome type spread out the light and make the unit luminous over its entire area. In the dome type the horizontal prisms of the inner element redirect the light only partially into the desired directions. The horizontal prisms of the outer element serve to complete the redirection of the light and secure the maximum candle-power at the desired angle. By this action all the light which the incandescent lamp or the gas mantle generates is effectively conserved and redirected in proper proportion in all desired directions.

The Holophane Glass Company stands ready to cooperate with any public official who would like to have an investigation made with a view to improving the street lighting system of his city. A letter sent to this company will bring a prompt response and the services of a trained engineer in helping to conduct the investigation without any charge to the city.

Shoecraft Joins Hoad, Decker and Drury

Announcement has been received that on August 1, Ezra B. Shoecraft, for the past nine years City Engineer of Flint, Mich., who resigned from that position recently, has become associated with Hoad, Decker and Drury, Ann Arbor, Mich., the new firm name to be Hoad, Decker, Shoecraft and Drury.

The addition of Mr. Shoecraft to the firm will enable it to extend its activities to the field of civil engineering to include city paving and other municipal engineering work. During Mr. Shoecraft's term of office as City Engineer of Flint, Mich., he was in charge of work totaling over $14,000,000.

O. J. Childs and Foamite Unite

Announcement has recently been made of the consolidation of the O. J. Childs Company, Utica, N. Y., and the Foamite-Firefoam Company, with general offices at 151 Fifth Avenue, New York City. This union of interests is of distinct advantage in the fire protection field, particularly with the development of the Firefoam automatic sprinkler system which has recently been worked out by the Foamite Company in conjunction with the Grinnell Company, Providence, R. I. The new organization will be known as the Foamite-Childs Corporation, with W. J. Childs, President of the O. J. Childs Corporation, as President. Shortly after August 1 the executive offices will be located at Utica, N. Y.

Sewer Joint Compound

To insure satisfactory sewerage systems it is necessary to use some type of compound which will not crack under a slight settling of the sewer and thus permit the leakage of sewage or allow roots to work their way into the sewer. The Waring-Underwood Company, Fernwood, Delaware County, Pa., manufactures an asphaltic cementing compound prepared especially for making water-tight joints in vitrified sewer pipe. It is claimed that this "Ideal" sewer joint compound has the added property of being adaptable for use in cases where the joints must be made when partly submerged.

In using this compound, the joint space of the sewer pipe is first calked with jute or oakum, leaving at least 1 inch open for the compound. The space, of course, will vary according to the size of the pipe and the requirements of the engineer's specifications. Where the pipe sections are of small size, they can be stood end up in pairs and the joint space readily filled after calking with jute or oakum. For large-size pipes the sections can be placed in a horizontal position on blocks and after calking the joint space to allowable depth, a "snake" or "joint runner" is placed in the same manner employed when pouring lead joints. This snake must be oiled to prevent the compound from sticking. The compound is poured at a temperature of about 400 degrees Fahrenheit, and for the best results this temperature must be maintained. Joints made in the trench are made with the use of a joint runner after the joints have been calked with jute or oakum. The presence of water almost to the top of the pipe will not destroy the effectiveness of the compound, provided it is poured at the proper temperature and care is taken to have the joint material run down one side and force its way under the bottom and up the other side.

It is said that the best results are obtained when the compound is melted and poured with-

4 Gunmen Captured—$2,800 Cash Recovered!

MEET Sergeant Frank Brennan and his Harley-Davidson Motorcycle—both members of the Elizabeth, N. J., Police Department. The Sergeant and his Harley-Davidson recently captured four notorious New York gunmen after a stiff fight in which two bandits were shot. $2,800 in cash was recovered.

All in a day's work for a Harley-Davidson. In over 900 cities and towns, these police motorcycles are hunting crime, chasing speeders, enforcing parking rules, answering emergency calls and performing a variety of daily service duties.

Cost? The Harley-Davidson's noted economy (50 miles for a dollar—gas, oil, tires, and all) and its long life make it an investment that pays big dividends to the city.

Write for special literature, the reduced prices and the improvements on 1923 models. Or ask your local dealer for free demonstration.

Harley-Davidson Motor Co.
Milwaukee Wisconsin

Harley-Davidson
World's Champion Motorcycle

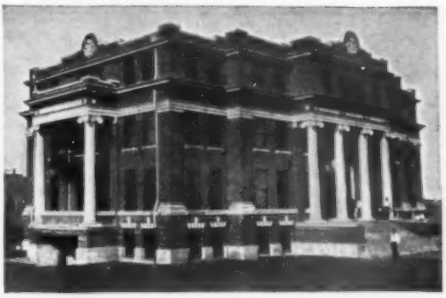
out excessive cooking. In order to guard against this cooking, it is advisable to use equipment which is not too large. For ordinary cases a small roofing kettle or lead melting furnace can be used to best advantage. A dipper or pouring ladle having a capacity just a little in excess of the material required for one joint is the best size to use. Several of these should be provided and kept warmed up before using. For large-size pipe, of course, a larger kettle will be required, but this should be of a type which is low and open at the top in order that the compound may be readily stirred. Otherwise, when a large quantity is melted, some of the filler will settle and cake on the bottom of the kettle. It is advisable to use up one batch of compound, if possible, before another is started. This will produce much more uniform results.

An interesting demonstration of the jointing qualities of "Ideal" sewer joint compound was shown in the case of a man who had to lay 510 feet of 6-inch pipe from a dam to a Pelton water-wheel which runs a ¾-horse-power generator, the head of the water from the surface of the dam to the turbine being about 44 feet. After the job was well started, the war affected the price of iron pipe so that it was decided to use terra cotta, under a maximum pressure of 20 pounds. Deep and wide socket pipe was used, but a test was first made, which burst the pipe at 55 pounds pressure. The joint held at 40 pounds pressure for one-half hour without showing any weakness, but the pipe showed sweating. The joints were made up as follows: The spigot and socket ends of the pipe were thoroughly dried. Then jute packing was rammed into the joint, using a calking iron. With the aid of an asbestos pouring runner the hot joint compound was poured. After the joint was cooled, a shoulder of 1 to 1 cement mortar was made, which completed the operation. Owing to a slight water-hammer when turning off the turbine, the joints at the lower end of the line blew out after a service of about two weeks, making it necessary to replace the terra cotta pipe with cast iron. The remaining terra cotta pipe at the upper end of the line, however, under a maximum pressure of 9 pounds, has been in service for over a year without showing any weakness at the joints.

Metal Columns for Municipal Buildings

The Colonial motif in architecture is increasingly used for city halls and other municipal buildings, such as hospitals, court houses, etc., in a great many cities in the United States. When columns are used in construction of this type, it is practically impossible to buy wood columns that will not sooner or later show checking, rotting, or similar defects. This is, of course, the nature of wood, but nevertheless, it is frequently felt that the contractor or the architects are somewhat at fault.

The Union Metal Manufacturing Company, Canton, Ohio, makes metal columns of a particularly durable nature for just such work as



THE FREESTONE COUNTY COURT HOUSE, FAIRFIELD, TEXAS, WITH ITS METAL COLUMNS

this. The columns are architecturally correct, have entasis and stopped flutes and the other characteristics which mark the columns of the ancient classical orders. They are so constructed that they cannot split, check, rot, warp or open at t he joint, and they cost but little more than wood. The shafts of the columns are made from 22-gage open-hearth galvanized steel rolled exclusively for the manufacture of Union Metal products. The steel is tight-coated with spelter, which adheres perfectly to the metal under all conditions and protects it from the action of the elements. Shafts up to and including a base diameter of 14 inches are made of one-ply No. 22-gage galvanized steel. All shafts over 14 inches in base diameter are made by two-ply No. 22-gage pressed and fluted together. The shafts are fluted and pressed into shape by patented machinery and dies designed for the purpose. The seams of the shafts are all securely locked and are always turned on the inside of the shafts. All but three of the designs are supplied with ornamental composition capitals The weight does not fall upon the composition capital, but is impressed through a cylindrical steel core pin directly upon the steel shaft. Two of the designs are supplied with cast iron capitals, including a top square member, and one has a pressed steel capital made of 16-gage steel galvanized after the punch press operation, thus insuring a protecting coat for all surfaces.

Before leaving the factory the steel shafts are painted with a coat of galvanized iron primer. The cast iron parts are coated with high-grade Metalastic paint. This completes the protection against the elements and furnishes a surface on which the finishing coats of paint can be applied with assurance that they will not crack or peel.

It is claimed that these are the strongest architectural columns manufactured. The principle of their construction, the fluted steel cylinder, is in accordance with the best engineering practice, and insures great compression strength many times stronger than that of wood columns. They are furnished to withstand all normal weight without reinforcement. Where an abnormally high pediment of weight is to be supported, however, they may be reinforced by steel I-beams or tubular steel poles passed up

NIAGARA POWER
FOR
NEW YORK CITY

THE SUPER-POWER PLAN STARTED

We have recently designed a 220,000 volt line for the American Super-Power Corporation to deliver 400,000 Horsepower from Niagara Falls to New York City.

We are now designing a 450,000 Horsepower Hydro-Electric Station at the Falls for the American Super-Power Corporation.

We design, build, operate and report on all Utility Plants, Electric, Street Railway, Water, Gas and Telephone.

F. W. BALLARD & COMPANY

Engineers — Cleveland, Ohio

through them, or they may be very economically filled with concrete. This practice is usually resorted to in interior work, such as stores, colonnades, hotel lobbies, etc., where the columns are called upon to support the building and at the same time perform the function of architectural beauty.

Attractive Iron Fencings for School Grounds

It has long been recognized that fence is a real necessity to enclose school grounds, and that the use of iron fence is one of the best means of meeting the demand for protection and durability. At the same time, iron fence serves to give a certain sense of restraint to pupils, impelling them to stay within bounds while at school, and, if used at their own homes, naturally exerts an influence on them after school hours in making their yards, instead of the street, their playground.

The Leavelle McCampbell School, Graniteville, S. C., has recently installed the iron fence shown in the accompanying illustration. This fencing was supplied by the Stewart Iron Works Company, Cincinnati, Ohio, and comprises 1,128 feet of iron fence 60 inches high, constructed with ⅝-inch square pickets spaced 5 inches on centers and with 1½ by ½-inch patent 3-rib channel rail. Seven gates were required, three walk gates each 4 feet 4 inches wide, two drive gates 8 feet 4 inches wide, and two drive gates 12 feet 4 inches wide. The gates and fence were designed by Willis Ervin, architect, of Augusta, Ga., and erected by W. F. Bowe, Jr., contractor, Augusta. The gates and fence were given to the town of Graniteville by the Graniteville Manufacturing Company.

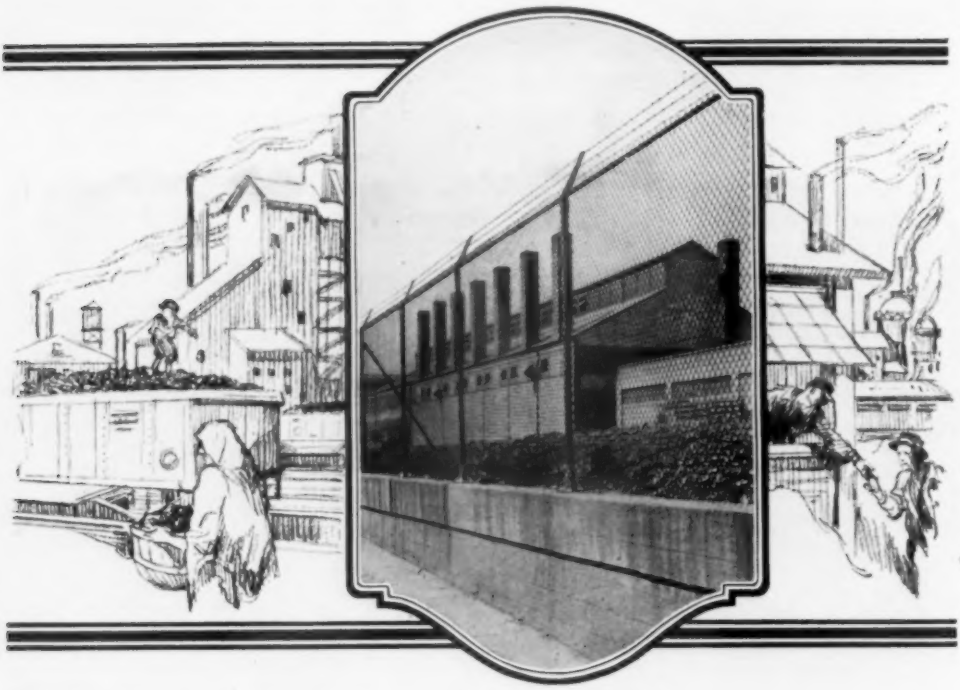
Where the grounds of a school such as this are not open, the old practice of leaving the school grounds from any and every point, is eliminated. Thus many of the dangers to which children are exposed as they dart across the street, unconsciously placing themselves in the path of automobiles, street cars and other vehicles, are eliminated; many lives are endangered every day by neglecting this safeguard. Iron fence is also used to good advantage for the division between the playground and the part set aside for flowers and shrubbery. Often the carefree boy, enthused over the game of ball, will step on the flower-beds and thereby destroy them.

A New Six-Cylinder Speed Truck

A new six-cylinder speed truck with one-yard dump body equipment is being furnished by the Avery Company, Peoria, Ill., to contractors and city and town officials. This truck, illustrated herewith, is sold with the all-weather cab and the all-service body, or it may be equipped with a school bus body and used in centralized school districts. Great satisfaction has been experienced by the Peetz, Colo., centralized schools, for which in District 9, one of these trucks equipped with a Knight-Tilden school bus body is used to make a trip of 24 miles twice a day, carrying 32 children. The trip is made in an hour and 30 minutes.

The dump-truck is a very handy proposition for speedy hauling within the city; where loads of about one ton are of frequent occurrence.

SCHOOLHOUSE ATTRACTIVELY SET OFF BY IRON FENCING



Put an end to petty thievery

Page Protection Fence surrounding municipal lighting plants, pumping stations, storage yards, and supply depots will eliminate costly thefts of coal, raw material and tools.

Its non-climbable chain-link construction forbids entrance to the petty thief, the vandal, and the trespasser.

Firmly constructed throughout, and with fabric heavily galvanized, Page Protection Fence withstands thieves, abuse and corrosion.

There is an expert fence-erecting organization in each of the cities listed below, that carries complete stocks of Page Fence Products and is equipped to give you prompt and efficient service in construction.

BINGHAMTON BIRMINGHAM BOSTON CHARLOTTE CINCINNATI DALLAS DETROIT KANSAS CITY LAFAYETTE LINCOLN MEMPHIS NEW HAVEN NEW ORLEANS NEW YORK OSCEOLA PHILADELPHIA RENSSELAER SPRING FIELD, MASS. ST. LOUIS

PAGE FENCE AND WIRE PRODUCTS ASSOCIATION, 215 North Michigan Avenue, Chicago

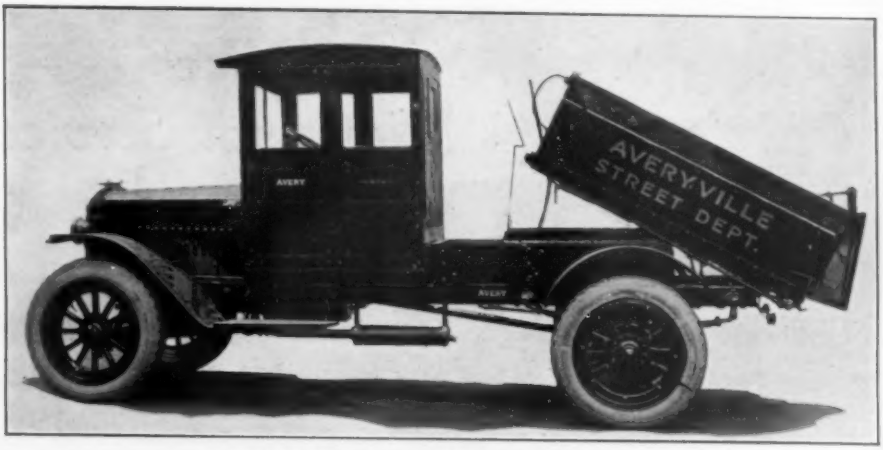
PAGE STEEL AND WIRE QUALITY PRODUCTS

America's first wire fence—1885

PAGE
PROTECTION FENCE

ARMCO Ingot Iron

The only wire fence made of Armco Ingot Iron



LIGHT TRUCK WITH ONE-TON DUMP BODY

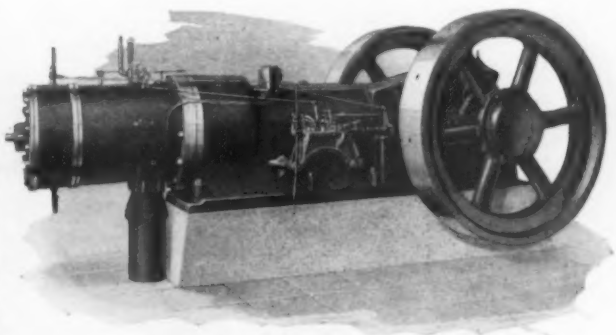
The body can be dumped by the truck operator, reaching through the small window in the back of the cab. The dump body is flexible, being made of heavy-gage steel.

P. & H. President Returns

Henry Harnischfeger, president of the Pawling & Harnischfeger Co., Milwaukee, Wis., has returned from a 6-months' tour around the world, during which time he visited Japan, China, the Philippine Islands, India and several European countries. The special object of the trip was the investigation of business conditions and possibilities in the Far East.

Heavy-Duty Semi-Diesel Oil Engines for Power-Plant Service

The Power Manufacturing Company, Marion, Ohio, which claims to have the largest plant in America devoted exclusively to the making of oil engines of the semi-Diesel type, has issued the following interesting comparison of the cost of power produced by steam, electric motor or the "Primm" semi-Diesel engines which it manufactures:



A SEMI-DIESEL UNIT FOR MUNICIPAL PLANTS

COMPARISON OF POWER COSTS

Kind of Power	Cost Per Hour		Cost Per 24-Hour Day		Cost Per 300 Days of 24 Hours	
	1 H.P.	1 K.W.	1 H.P.	1 K.W.	1 H.P.	1 K.W.
Steam, using 5 lbs. of coal per h.p. per hour, at $4 per ton	1c.	1.34c.	24c.	32c.	$72.00	$96.48
Electric motor, 85% eff., using current at 3c. per kw.	2.63c.	3.52c.	63.3c.	84.8c.	189.90	234.46
Oil engine, using .6 lb. (.08) gal. fuel oil per b.h.p.-hour, at 4½c. per gal.	0.36c.	0.482c.	8.64c.	11.6c.	25.92	34.73

SAVING WITH A "PRIMM" OIL ENGINE, 100 B.H.P.

	Per Day 24 Hours	Per Month of 30 Days, 24 Hours	Per Year of 300 Days, 24 Hours
Replacing steam engine, 100 b.h.p., using 5 lbs. of coal at $4 per ton	$15.36	$460.80	$4,608.00
Replacing an electric motor, 100 b.h.p., 85% eff., using current at 3c. per kw.	54.66	1,639.80	16,398.00

For Municipal Service

LEE-4D

One Body for Garbage, Refuse and General Hauling

The new Lee 4-D refuse body which dumps without power is being used by a great many cities for hauling light rubbish, consisting of papers, boxes and trash of all kinds, garbage and refuse, crushed stone, excavated earth, barrels of tar, tools, supplies and other materials used by maintenance gangs in street work.

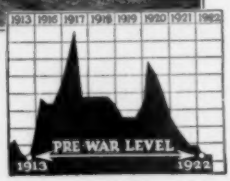
Bulletins 75-AC and 78 give specifications on all types. Secure these bulletins when you are making plans for the purchase of a new dumping body for any light-weight truck.

Bulletin 77-AC gives cost data of the operation of this equipment as used in Evanston, Ill.

LEE TRAILER & BODY COMPANY

2343 South La Salle Street **CHICAGO, ILL.**

Buy That Iron Fence Now!



Cost of Iron Back to 1913

Enterprise Iron Fencing is now selling at the lowest prices in years—a result of the reduced cost of iron. The cost of iron is back to the pre-war level. Wait no longer for the fence you have needed and wanted. Buy it **now!** Write for our illustrated catalog and our free blue-print offer.

ENTERPRISE IRON WORKS

2465 Yandes Street **Indianapolis, Indiana**

Free Blue Print.
Free blue-print showing Enterprise Fencing on your ground. Write for illustrated catalog and quotation today.

ENTERPRISE FENCING

Buy Now for Less.
Protect and beautify Schools, Hospitals, Parks, Estates, Public Buildings, Cemeteries, Asylums. Lowest cost in years.

A SPOTLIGHT UNIT

Illuminating the Traffic Cop

There is not much use in placing a traffic policeman with a stop-and-go signal at a poorly illuminated street crossing. There should be a well-illuminated section about him so that oncoming automobilists, for whom 99 per cent of the present traffic control is necessary, may see him. The National X-Ray Reflector Company, 235 West Jackson Boulevard, Chicago, Ill., has made a specialty of projectors for illuminating traffic police. Many cities are using traffic signals with concentrated lights, spotlighting the officer. This is claimed to have been originally developed for the city of Camden, N. J., by this company in cooperation with J. W. Kelly, Jr., Chief of the Electrical Bureau. The projector units are suspended 22 feet above the street on a guy wire or mounted on a street post by means of a gooseneck. Using a standard 200-watt lamp, there is a bright spot of light 6 feet in diameter, which makes the officer and his signal clearly visible at night for a distance of more than 1,500 feet.

This company has also made a specialty of heat-resisting colored lenses for mounting on traffic towers. These are used in Detroit and Baltimore with great success. The colors are standardized for traffic signals, red indicating "Stop," amber indicating a change of traffic, and green indicating "Go." These can be controlled automatically by a flasher or by a switch for each set of signals, depending on local conditions. The interval between the red and the green signals is usually two minutes. Twelve towers under construction in Detroit at present are to have the X-Ray reflectors mounted flush with the tower, similar to that used in Baltimore. The traffic signal lights are used day and night. Either 150- or 250-watt round-bulb lamps are used with the concentrating reflector, and the signal is clearly visible at a distance of a half-mile during the day. At night it can be seen for even a greater distance. Traffic control lighting requires a weather- and heat-proof color lens and a concentrating reflector of high permanent efficiency to produce a good "punch" of light that will be visible at a considerable distance.

Speeding Up Snow Removal

Getting rid of the snow after a heavy snowstorm is a considerable burden in New York City, both financially and physically. A very large portion of this labor is the shoveling of the snow into trucks or wagons to be hauled to a river or dumped. Not only is the item of shoveling from the piles to the truck a great expense, but it is the part of the work that takes the most time. It is not possible to have more than ten men loading one truck under most favorable conditions, and it will usually take them 12 to 15 minutes to load a big truck with extra sideboards so that the truck holds about 8 cubic yards. Contractors taking snow removal work in New York City usually have enough trucks to operate under a 2-minute headway if the dump is not too far away from the work, providing they can load fast enough. With hand shoveling they find it necessary to load a number of trucks at a time, increasing

A LOADING MACHINE THAT CUTS SNOW-REMOVAL COSTS

WHY TIFFIN FLUSHERS

Superb Construction, Superior Design,
Specialized Quality Units, Unity of Service

ECONOMY, EFFICIENCY, DURABILITY, SANITATION

Ask users about Tiffin Flushers and Tiffin Service.
Write us for catalog and engineering detail.

THE TIFFIN WAGON COMPANY, TIFFIN, OHIO

International Steel Paving Guards Cut Paving Costs-

Don't Waste Money Building Headers—

Header Curbs have gone into the discard like horse cars. They cost time and money to build and under even ordinary traffic are unsatisfactory. INTERNATIONAL STEEL PAVING GUARDS have supplanted them and 325,000 feet in use under severest conditions of traffic prove their great superiority.

Built of standard structural angle with inch-wide anchors cut out of the horizontal leg every ten inches, twisted and bent like reinforcing bars and extending into the concrete, these guards protect the road edge. Built in various sizes for all types of surface and foundation.

Send for circular today

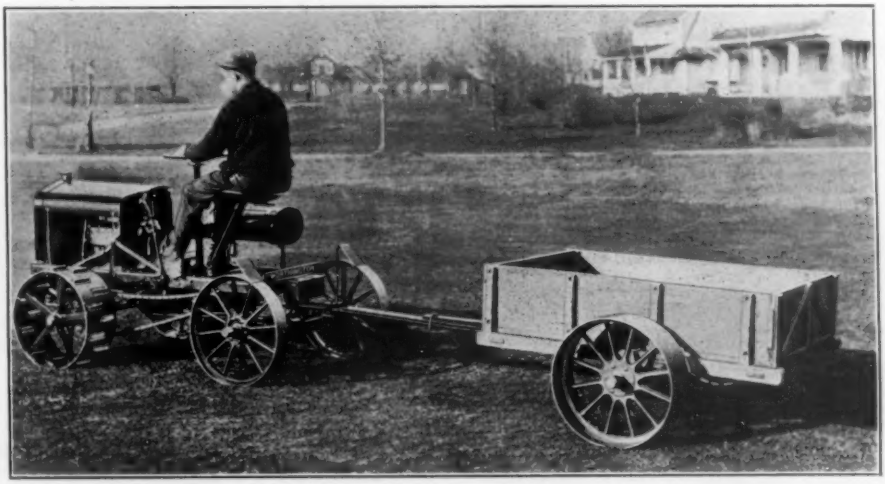
International Steel Tie Co., Cleveland, O.

the headway thereby and requiring several loading gangs. The cost of hand shoveling is estimated at about 13 to 20 cents per cubic yard.

A machine for doing this loading was in operation in the Mott Haven district of New York City, helping one contractor to dispose of one of the February snow-storms of 1922. This machine, developed by the George Haiss Manufacturing Company, Inc., 143d Street and Rider Avenue, New York City, consists of a 20-foot pan conveyor operating at an angle of 30 degrees from the horizontal, with the lower end at ground level at the snow pile. Attached to the tail shaft extending on either side are feeding propellers, pushing the snow into the pan conveyor and cleaning a path wider than the machine. The loader is driven by a 37-horsepower, 4-cylinder Waukesha truck engine and is mounted on creeper treads, preventing slipping and skidding. The elevator is pivoted at the center and is raised to a horizontal position when moved any distance. The loader is moved under its own power.

The machine was used for loading the high piles in important streets, and readily loaded 7.7-cubic-yard trucks in 2 minutes or less. This particular snowfall was a combination of rain, sleet and snow and was followed by a hard freeze. The snow piles were unusually difficult to handle, as they were frozen and had to be broken down by hand; otherwise the snow loader just slid them intact along the streets, although they averaged 10 to 15 cubic yards each. Had the fall consisted merely of snow, this additional labor of breaking down the piles would not have been necessary.

The contrast between machine loading and hand loading was very marked even so. With four men breaking down the piles and one machine operator, a speed of one truck every 2½ minutes was not at all unusual, including the time for getting the loaded truck away and placing the empty one. In other words, the machine with one operator and four loaders was equivalent to five or six 10-man shoveling crews. The advantage from the standpoint of superintendence is very evident. As to operating cost, assuming that half the time is used up in moving the machine, its average performance is 1½ cubic yards a minute, or 720 cubic yards in an 8-hour day. The cost is about $4.20 for gasoline (15 gallons at 28 cents), $6 for the operator, and four laborers at $4 a day each, making a total of $26.20, or about 3.64 cents per cubic yard. This represents a saving of 10 cents or more per cubic yard over hand labor, or $72 per machine day. With this money saving, which will be greater under ordinary snowfall conditions, and the time saving, it does not take very long for the machine to pay for itself.



A NEW HANDY TRAILER FOR PARK USE THAT WILL NOT MAR THE LAWN

Trailer Units for Park Hauling

Have you ever noticed how quickly an ordinary iron-tired wagon will cut up and destroy a park lawn? Many superintendents will take excellent care of their greensward, weeding it carefully and mowing it at the proper time, and then when it comes time to make some changes in flower-beds or in the grading, they will drive heavy wagons over the grass, badly cutting up the sod.

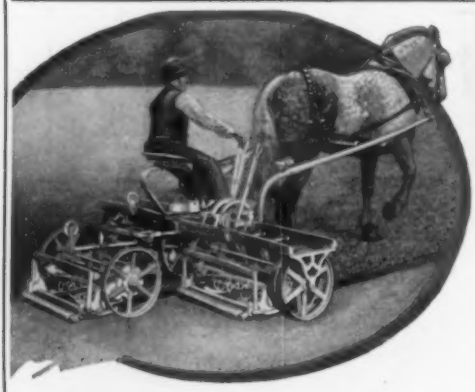
The Worthington Mower Company, Shawnee-on-Delaware, Pa., has brought out a light-weight two-wheeled trailer unit with broad steel wheels which is admirable for use in conjunction with its light-weight tractor unit for hauling sod, tools and the many other materials which are to be cared for in parks and on golf courses. This two-wheel tractor, illustrated herewith, is in use in a number of municipal and county parks and a very large number of country clubs and golf courses.

"ACME" (NESTABLE)
<TONCAN METAL>
CORRUGATED CULVERTS

In the development of suburban sites "ACME" (Nestable) Culverts offer an inexpensive and permanent means of drainage. Moreover, by the use of cement or stone work they can be made into very attractive forms, such as above.

This pleasing installation is in Shaker Heights Village, suburb of Cleveland. The two 6-foot "ACME" sections are faced at the end with rough ashler stone work. Installed 1911 — still in perfect condition. Have you catalog M-78?

THE CANTON CULVERT & SILO CO., Mfrs., CANTON, OHIO



Pennsylvania TRIO; a time and labor saver for golf course, parks, large estates and 86 in. swath.

PENNSYLVANIA
Quality
LAWN MOWERS

Whether used in gangs or singly each mower represents the utmost in mechanical perfection. Exclusive features such as self-sharpening, interchangeable parts, automobile type ball bearings assure ease and accuracy in operation.

Their long record of service is due to the use of finest materials in making. For instance, all blades, not just one, as in ordinary mowers, are made of crucible, tool steel; doubly tempered.

Write for "Pennsylvania TRIO Book"

Pennsylvania Lawn Mower Works, Inc.
1615 NORTH 23rd STREET, PHILADELPHIA

SEWER-CLEANING BUCKET MOUNTED ON TRUCK

A Rapid Catch-Basin Cleaner

A new device which is designed and constructed for rapidly cleaning catch-basins has been placed on the market by P. J. Healey, 25 Church Street, New York City. The machine consists of a truck upon which is mounted an especially designed dumping body which may be removed, allowing the truck to be used for other purposes. Upon the truck platform is a mast and boom, the mast resting upon ball bearings so that the boom may be swung directly over the catch-basin. A grab bucket, operated by power-driven drums using two cables, one for hoisting and lowering the bucket and the other for opening and closing it, is carried by the boom. A pole is used to direct the bucket, making it possible to clean the entire circumference of the catch-basin without sending a man below the surface.

The dump body on this device can be used as a container and may be dumped directly into another truck, so that while the second truck is taking its load to the dumping point or scow the container on the machine can be reloaded, ready to be discharged into the empty truck upon its return. The operation of the truck in conjunction with the cleaner prevents loss of time. The cleaning machine may be continually operated, proceeding from one catch-basin or sump to another, or to any place from which it is desirable to remove deposits, and without the loss of time which would be experienced were the machine itself sent to the dump.

The grab bucket, which is of the orange peel type, has a large capacity, making the operation of the machine very rapid. Various tests have demonstrated that catch-basins can be thoroughly cleaned in 20 to 30 minutes per basin and the usual litter and wet pavements are noticeably absent.

Protection Through Proper Fencing

One of the important factors in protecting an open reservoir, or valuable planted park grounds and playground areas where it is desired to have the children enter and leave by a definite entrance and exit, is a fence which is permanent, not too ornate, and strong enough to stand the attacks of the malicious.

Among the designs of wire fabric fencing made by the Page Steel and Wire Company, Adrian, Mich., is the Page Economy fabric. This was originally designed as an especially effective lawn and park fence, but it has found considerable favor, not only in industrial uses, but for protected places such as reservoirs, cemeteries, and playgrounds. This fence is well designed and of high quality, and for most municipal needs, except where the very strongest fence is necessary, is entirely suitable. It differs from the Page Wire-link fabric in that the latter was designed especially to fit industrial uses.

ROUND AND HALF ROUND CULVERTS

Newport Culverts are made of GENUINE OPEN-HEARTH IRON, guaranteed to be 99.875 per cent pure iron copper alloy. They insure the maximum of endurance and satisfaction under city streets or county highways and will last indefinitely.

Newport Culverts are made in both round and half-round types. The half-round type is particularly adapted to city and small town use while the circular culvert is universally used for county highway work. The advantage of the half-round culvert is that it is just right for service where the head room is not sufficient for the installation of the full-circle type. It has the further advantage of easy cleaning in the event that an obstruction causes a stoppage, which is frequently the case in city or small-town use.

Send for booklets giving complete data on NEWPORT CULVERTS OF "GENUINE OPEN-HEARTH IRON."

NEWPORT CULVERT COMPANY

542 West Tenth Street, Newport, Kentucky